The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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The Siemens-Cowper-Cochrane Hot-Blast Stoves.

The Siemens regenerative system for the economical generation of high temperatures, has advanced the practice of many departments of metallurgy materially in some instances, while in others it may be said to have made new methods practically possible. The advantages attending the use of highly heated blast have been too generally recognized within the last few years to demand recapitulation. They have become attainable by the adaptation of the Siemens regenerative system to the heating of blast. As is frequently the case with improvements of value, the application of this system has gone through a long time of experimenting and of trial. It was first used by Cowper in 1860, and applied by Messrs. Cochrane at Ormesby, near Middlesborough, and has since been so modified that in their present improved construction these fire-brick stoves have overcome the evils attending the defects of their original shape. The accompanying illustrations, for which we are indebted to Messrs. Taws & Hartman, of Philadelphia, show the present approved practice. The stoves, which are 50 feet high and 15 feet in diameter, consist of an air-tight shell made of ¼-inch common boiler iron, linedwith red brick and fire-brick. Near one side of the stove is placed the vertical combustion chamber, which is 4 feet 4 inches in diameter and 42 feet high. Parallel to and alongside of it is the regenerator, formed of fire-brick 2½ inches thick, set on edge so that their flat sides are exposed to the current of air or gas, respectively. These bricks are so built up that they leave openings 4 inches square, extending from the top to the bottom of the regenerator. As will be seen from the section, Fig. 3 (see page 3), the openings are contracted in the upper part of the regenerator, in order to cause the gas or air to spread over the whole upper surface of the regenerator, and thus insure its distributing and going down all the openings uniformly. In the aggregate the regenerative chambers have 40,000 square feet of heating surface. Both the regenerator and the combustion chamber are independent of the side walls and the roof, and of each other, so that repairs can be made without taking down one part to get at another. The gas, which is brought to the stoves in flues 18 inches in diameter, is admitted in thin strips at the bottom of the chamber, (see Fig. 4, page 3), and mixes at once with the air of combustion which enters through 18-inch pipes, just above the gas flues. The hot products of combustion ascend in the combustion chamber, and, passing downward, sweep through the regenerator to the chimney flue, which is 36 inches in diameter. The chimney is 4 feet 8 inches in diameter in the clear, and is made 145 feet high. The flues are all overhead, and can be cleaned in ten minutes during casting time. The waste gases from the blast furnace are washed before they are allowed to enter the stoves, in an apparatus shown in Fig. 1. The waste gases first strike upon an inclined division plate, which causes much of the dust to fall into a dust-catcher; then they pass back of the plate through an opening into the vertical pipe immediately below the plate. While descending in this pipe, they meet sprays of waste tuyere water which cleanse them of the greater portion of the dust. All the dust which settles in the stoves themselves is removed in five minutes twice a week, at casting time, by blowing the whole volume of air from the blowing engine through them. This method has proved so effectual that the stoves at the Crown Point Iron Works, when examined after 13 months' use, were found to be clean, while the brick had remained unglazed. Provision has also been made for sweeping the stoves should it be desired to do so. One cap in the top is removed, which is sufficient to get at all the openings.

The time during which one stove is heating the blast for the furnace is two hours, this period being called a "blow." As four hours are needed to heat the stove up again by the combustion of the blast furnace gases, it will be seen that three stoves are necessary for a plant. During a "blow" the temperature of the blast is lowered from 100 to 200 degrees. With a view of equalizing this an automatic valve is provided, which at the beginning of the blow admits some cold air directly into the hot-blast pipe, so that, by mixing with it, the blast, which is too hot at the beginning of the blow, is cooled down to the proper temperature. As the blow continues the cold air is gradually cut off.

To operate the stoves the hot blast and the cold blast valves are closed, the chimney valve is opened and a burning torch is put through the air valve into the combustion chamber. The gas valve is then gradually opened until the gas fires, when the valve is thrown wide open. After burning for four hours the stove is ready for a "blow" for heating the blast. The gas valve is first closed, then the air, and finally the chimney valve; the cold-blast valve is opened and at last the hot-blast valve, whereby the blast is permitted to blow through the stove. The stove last on a blow is then turned on gas. The gas escaping from the stoves has quite uniformly a temperature of 400 degrees, while the blast is made as hot as 1700° F. The stove, it will be seen, is simple in construction and inexpensive in maintenance and repairs. It can be built by workmen of ordinary intelligence in about two months. Each stove contains 43,000 red brick, 10,000 No. 1 and 70,000 No. 2 fire-brick. For a set of three stoves there is required boiler plate work weighing 186,000 pounds and 213,000 pounds of castings.

In localities where materials are cheap, the cost is said to be about $16,000 for stoves heating 8000 cubic feet of air per minute to 1700 degrees. Many are now at work in England, Wales and on the Continent, 30 being used at Creusot alone. In this country, they have been employed at the Crown Point Iron Works, Lake Champlain, and we learn that 9 stoves are being put up at the Edgar Thomson Works, near Pittsburgh.

The following is the average of one year's work, the blast being heated to 1210 degrees, and the coke containing 9 per cent of ash:

	Cwt.
Coke to ton iron	20.69
Ore " "	48.80
Limestone to ton iron	12.50

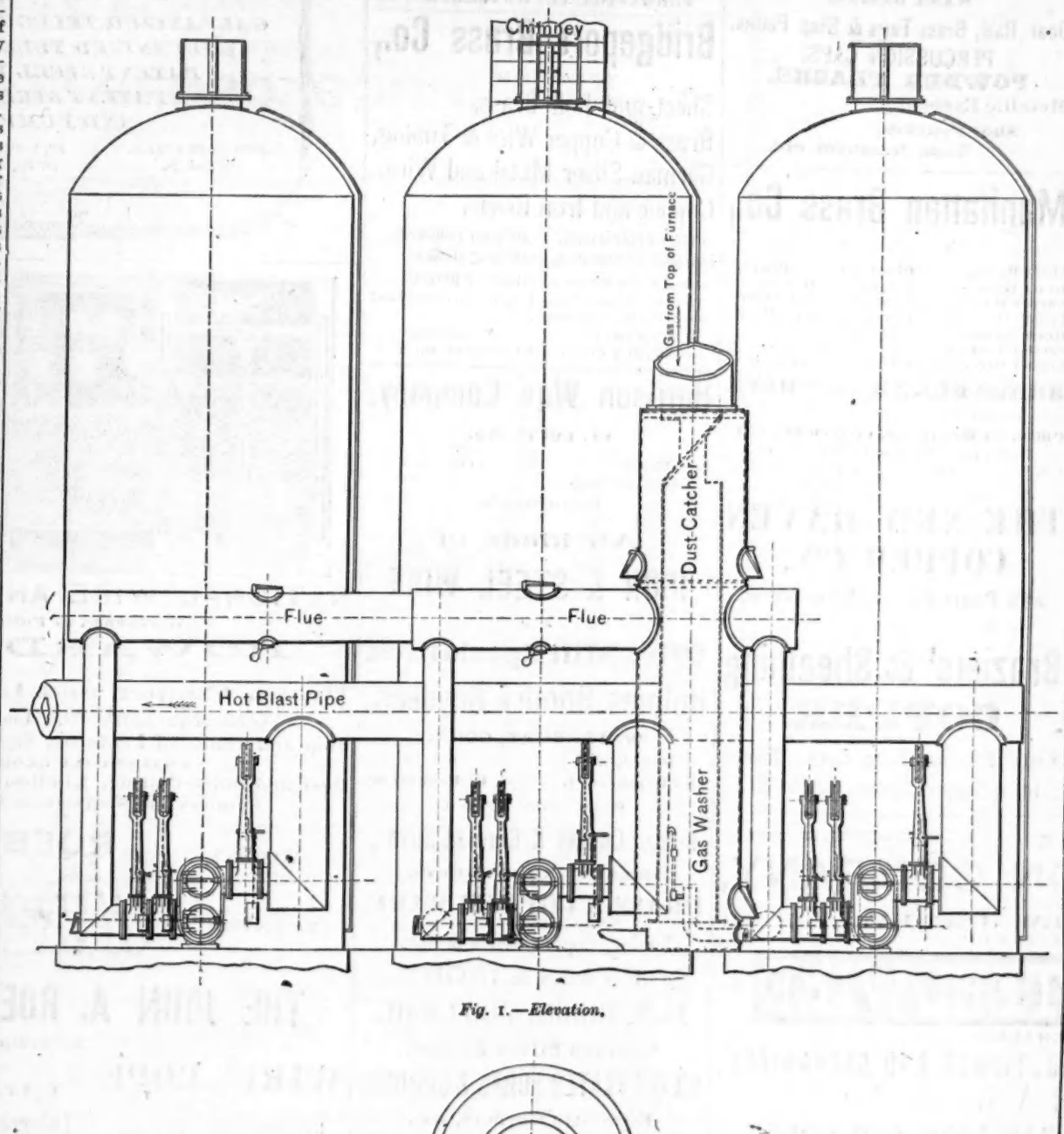

Fig. 1.—Elevation.

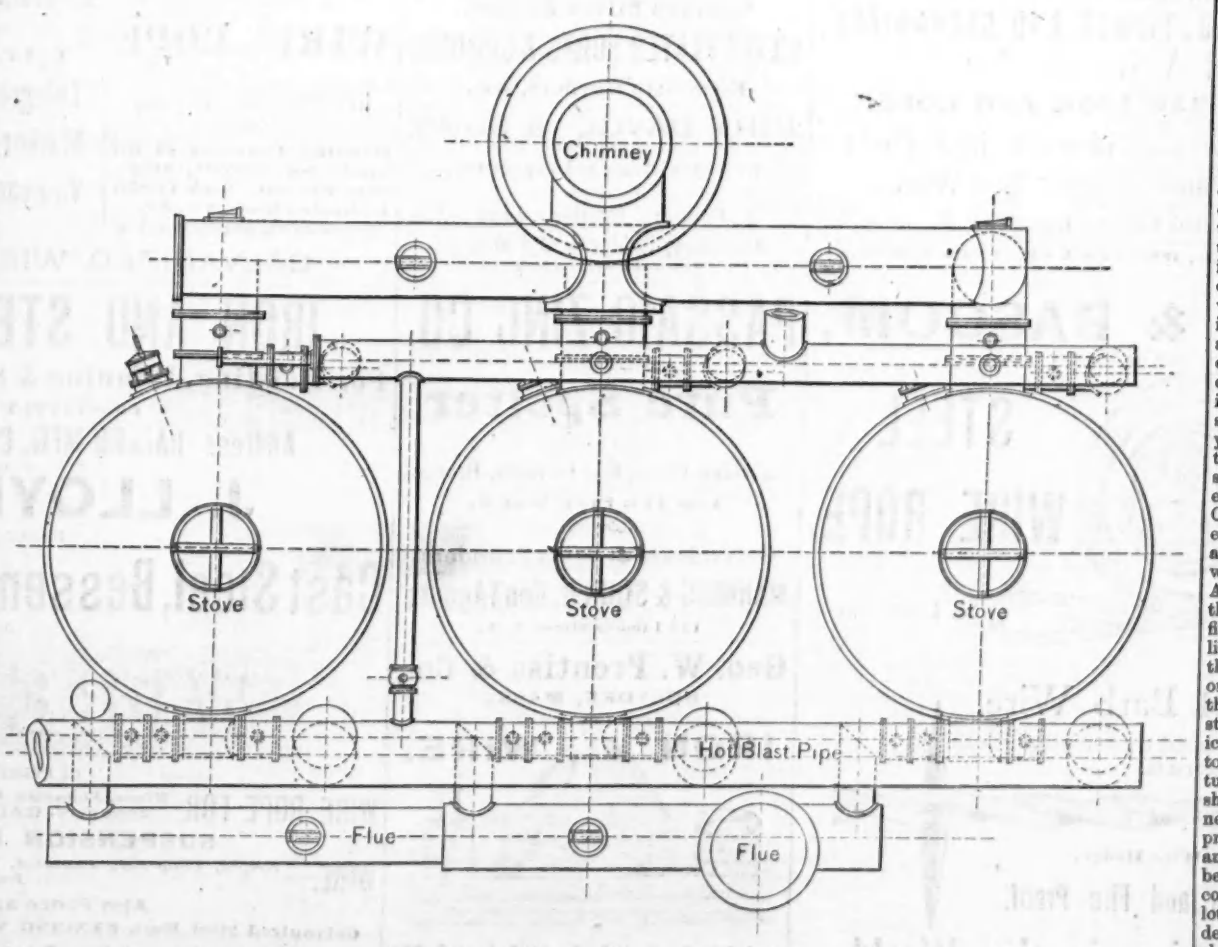

Fig. 2.—Plan.

THE SIEMENS-COWPER-COCHRANE HOT-BLAST STOVES.

Piece-work in England.—A correspondent, writing from Birmingham, says: One of the worst results of the difficulties between masters and men has been occasioned by the introduction of piece-work, which at first appeared favorable for both parties, inasmuch as it enabled the employer to pay for no more work than was absolutely done, and, on the other hand, induced the men to be more industrious through a desire to finish one piece and be paid for it, instead of simply working on time. Now, however, it seems to be admitted that though in some cases it would be difficult to return to the previous system, piece-work is almost always uniformly bad. It is found, especially in the manufacture of prints and stuffs, that the work is much worse done than under the old system, although there may be more of it. Under the time system the workman was always willing to stop the machine to correct flaws and take up threads, whereas under the piece system not even the strictest surveillance is capable of making him do this. He is anxious to get through his quantity, and stopping the machine would delay him, and he cares little what the quality of his work may be.

The German Tariff.

The following are the rates of import duty for the German Empire, advocated by Prince Bismarck and passed by the "Bundesrath," the upper house of the Empire. As it is likely to pass the second legislative body also, it deserves attention:

Iron and Steel.

	Per metric ton.
Pig iron of all kinds	$2.44
Iron, in bars, L and T iron, rails, fish plates, ties, &c.	6.10
Blooms, muck bar and ingots	3.66
Ordinary sheet iron	7.32
Polished, japanned, coppered sheet or tin plate	12.20
Wire, ordinary, coppered, tinned, galvanized, &c., 0.2 inch in diameter or above	6.10
Below 0.2 inch	7.32
Coarse castings	6.10
Iron for coarse parts of machinery, bridges or parts of bridges, anchors, chains, wire rope, wrought-iron tubing	7.32
Iron ware in the rough, ground, galvanized, tinned, &c., but not polished, such as axes, files, hammers, planes, sword blades, cooking utensils, nails, pans, knives in the rough, scythes, sickles, tower clocks, chains and ropes for towing, &c.	free
Fine castings and fine steel or iron articles, polished or lacquered, knives, scissors, knitting or crocheting needles	60.56
Sewing needles, pens, parts of watches, guns	146.40

Metals.

Pig lead	free
Sheet lead, type	$7.32
Coarse articles of lead, combined with wood, iron, zinc or tin not polished or lacquered; wire	14.64
Fine articles of lead and lacquered do	60.56
Pig copper and other base alloys or articles therefrom not elsewhere specified	24.16
Copper, hammered or rolled, wire or telegraph cable	free
Plated sheet copper or wire	68.32
Coarse manufactures of sheet copper or brass, brass tubing and wire cloth	48.80
Other manufactures of copper not specified	68.32
Manufactures of aluminum, nickel, Britannia ware, bronze, German silver	146.40
Zinc, or alloys of, with lead or tin	free
Sheet zinc	7.32
Coarse manufactures of zinc	14.64
Fine " "	60.56
Pig tin	free
Sheet tin	7.32
Coarse manufactures of tin	14.64
Fine manufactures of tin, lacquered or polished	60.56

These figures, it will be conceded, are by no means excessive. It should not be forgotten that the terms used in the framing of this new law are in accordance with the new nomenclature, so that "schmiedbares Eisen," translated in the above "iron," includes much of what is usually termed steel.

Conditions of Successful Trade With Brazil.

Mr. Herbert St. Smith, in an article contributed to *Scribner's Magazine*, writes as follows concerning the failure of many of the attempts made by American merchants to establish profitable trade with Brazil:

Unfortunately, many American merchants go to Brazil with very vague ideas of the country and its people. Young commercial men imagine they can secure a footing at once simply by placing American goods, often of a very inferior grade, on exhibition. Commonly they get discouraged after the first few months and leave the country in disgust. The worst of these abandoned enterprises is that they deter other and wiser men from entering the field. Americans may as well dispossess their minds of all these crude ideas. If we are to secure a commercial footing in Brazil, it will be by careful and persistent effort, and by studying the wants of the people, not by wild speculation. It is no wonder that these young clerks, ignorant of the language and the country, are unable to compete with the shrewd Brazilian merchants and with well-established English and German houses. Our American manufacturers should employ experienced agents, and in most cases, probably, they would do well to ally themselves with enterprising Brazilian houses, or with American residents of old standing. Then they must be content with small profits at first; new wares push their way little by little. Especially must they avoid flooding the Brazilian markets with inferior goods, or those that are not suited to the wants of the people. Brazilian merchants, for instance, complain that the patterns of American print cloths do not please their customers. The fault is that our manufacturers have sent them the high-colored, showy goods which are sold to Southern negroes. The more refined Brazilian taste prefers the light-striped and flowered French and English prints. Americans, too, must be reconciled to the tediousness of Brazilian commerce. Our active business men are loth to accustom themselves to these endless delays. Custom-house, travel and freight shipments, licenses, all require a large stock of that peculiar Brazilian virtue—*paciencia*. If you take a note, it is for a year or twenty months, or more; if you are promised a custom-house clearance on Monday, expect it on Thursday.

In large transactions the Para merchant is governed, perhaps, rather by a wholesome regard for the law than by any abstract moral reasoning. In retail business, I am bound to say that he is quite as reasonable as his Northern brother. I seldom had occasion for "beating down" a shopkeeper

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Planished Brass, Polished Brass Door Rails, Hayden's Patent Brass Kettles, Brass Tubing, Lamp Burners, Sun Burners, Planished Copper, Copper Rivets & Burs, Braziers' and Bolt Copper, Braziers' Rivets, Copper Tubing, Iron Wire, Fence Wire.
Seamless Brass & Copper Pipe.

THE ANSONIA
Corrugated Stove Platform.
SEE PAGE 9.

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Of all sizes straightened and cut to order.

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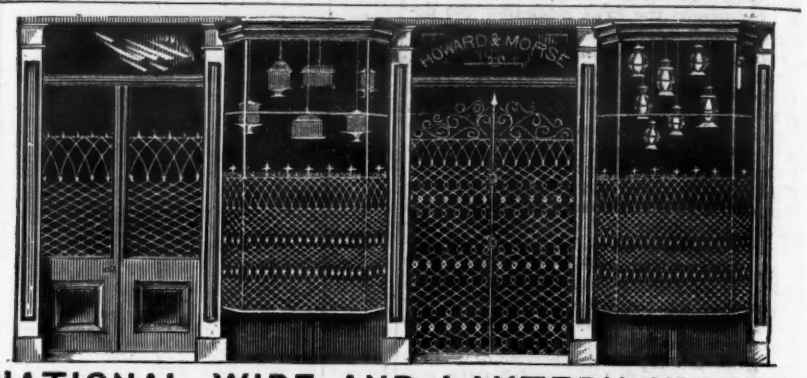

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Selling Hardware in Belgium.

A correspondent of the *Ironmonger*, writing from Belgium, says:

I have been struck during my rambles in Belgium at meeting with but few English commercial travelers. I have fallen in with Frenchmen in plenty, with Germans and with one or two Americans; I also met an Irishman the other day who had come to Ghent, travelling for a linen factory in Belfast; but he was the first commercial representative of our people whom I have seen here. I have not fallen in with a single hardware agent, and, what is more, I learn from ironmongers, both in Belgium and Holland, that the English are seen far too little in these countries. Representatives from firms in Sheffield and Birmingham come for orders about twice a year; but too little cars is taken to pick up the business, which may be done at odd moments, when, through some cause or other, a sudden demand for a particular sort of goods is felt on the market. The long and severe winter through which we have passed has produced a brisk sale of warming apparatus, lamps, kitchen utensils, scuttles, fire-irons, &c.; but the French and Germans, through having so many travelers, seem almost to have monopolized the benefit of these extra demands. I suspect that the paucity of English travelers is due to the fact that so few of our people speak French fluently. I would, therefore, most earnestly recommend the study of this useful language in our English commercial schools, and also to young men of business who may have leisure hours of an evening. I think, too, that young Englishmen should try and cultivate those conversational arts in which the French shine. The French make capital agents, for they are lively, pushing and persuasive; nothing daunts them; they will ply their tongues upon a tradesman in all sorts of ways till they discover his weak point, and they very seldom leave a shop without carrying away an order. Englishmen appear to do business in a rather too gentleman-like fashion—coldly and stiffly, in the "take it or leave it" style. They call attention to the excellence of their wares by serious argument, but are too apt to forget that these Continental races are garrulous, love "gush," and, moreover, mix up sentiment even with matters of business. The "No" which a steady-going English tradesman utters over his counter generally means a decided negative. In these countries it means "No," subject to ulterior discussion. All these Continental peoples are dreadful wasters of time and words, and cannot be persuaded to transact any business with a man who is in a hurry. Let me add that a great deal of business is done here over a friendly glass in a café. The French hardware traveler who has spent an unsatisfactory day in meeting rebuffs from door to door does, not lose heart on that account. He waits till evening, and, having ascertained in what café the leading tradesmen are wont to pass the after-dinner hours, he proceeds thither and tackles them afresh, pleasantly, glass in hand. Sometimes he pushes his devotion to the length of playing dominoes or billiards with them; sometimes he sings a comic song or airs his talents on the concertina. It is easy to smile at these doings as undignified; but, after all, they constitute the diplomacy of trade as Continentals understand it.

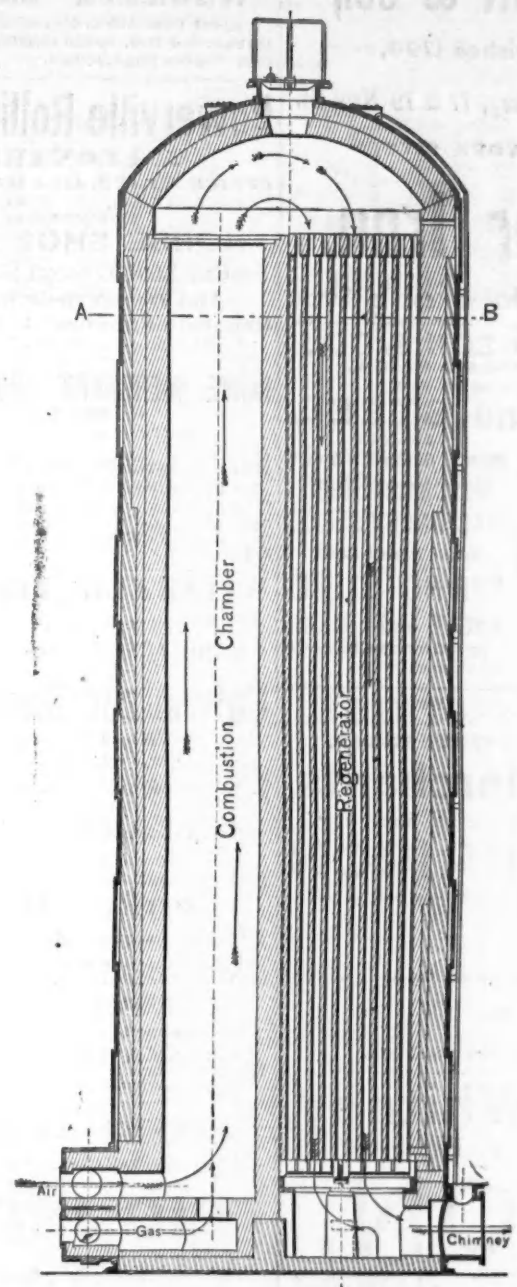

Fig. 3.—Section of Hot-Blast Stove.—(See page 1).

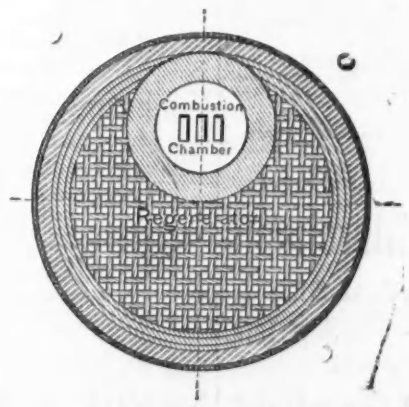

Fig. 4.—Section A. B.

THE SIEMENS-COWPER-COCHRANE HOT-BLAST STOVE.

The New York Exhibition of 1883.—The committee of citizens having in charge the selection of a site for the location of the World's Fair in 1883, have at last agreed upon a suitable place. The committee consists of Jackson S. Schultz, Orestes Cleveland, Col. Hoe and Messrs. Vance and Tiffany. A report is being prepared and will be submitted for publication within a few days. It was resolved at a meeting of the committee that the location should not be divulged by any member of the committee previous to the publication of the report. It is believed that the site selected is a tract of 170 acres on Long Island Sound, extending from Port Morris to the Southern Boulevard. The reason of the committee for refusing any information on the subject is their desire to prevent speculators in real estate from taking an unfair advantage of the owners of land in the neighborhood, by purchasing in advance of the publication of the report.

The work in the tunnel under the Detroit River at Gross Isle was begun April 22 on the Canada side.

Iron.

NEW YORK.

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Agents for the sale of
Fall River Iron Co.'s Nails, Bands, Hoops & Rods.
AND
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IRON MERCHANTS
Cor. Albany & Washington Sts.,
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(Late of and Successor to Jas. H. Holdane & Co.)
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BOILER PLATES and SHEET IRON,
LAP WELDED BOILER FLUES.
Boiler Rivets, Angle & T Iron, Cut Nails & Spikes.
Agency for Pottstown Iron Co., Viaduct Iron Works, Lebanon Rolling Mills, Pine Iron Works, Laurel Iron Works, The Bergen Rolling Mills, at Jersey City.

Houdlette & Ellis,
Manufacturers of and Dealers in
MERCHANT BAR IRON,
Homogeneous Steel and Iron Boiler Plates.
Sheet and Tank Iron. Boiler, Tank and Safe Rivets.
Best Lap-Welded Iron Boiler Tubes.
Wrought Iron Girder, Deck, and Channel Beams.
Angle, T and Grooved Iron.
Steel and Iron Forgings, Bessemer Steel Cut Nails.
Genuine and Standard Babbitt Metals,
Crescent Brand Journal Bearings.
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Iron.

NEW YORK.

A. B. Warner & Son,
IRON MERCHANTS,
28 & 29 West and 52 Washington Sts.
BOILER PLATE,
Boiler Tubes, Angle, Tee & Girder Iron, Boiler and Tank Rivets.
Sole Agents for the celebrated
"Eureka," Pennocks,
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Brands of Iron. Also all descriptions of Plate, Sheet, and Gasometer Iron. Special attention to Locomotive Iron. Fire Box Iron a specialty.

Powerville Rolling Mill
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OFFICE & YARD, 450 & 451 West Street, Cor. Bank Street. NEW YORK.
MANUFACTURER OF
HORSE SHOE IRON,
Toe Calk Steel, Charcoal Scrap Blooms,
And Dealer in Scrap Iron.
Rehoboth Furnace, - Iron Station, N. C.
COLD BLAST CHARCOAL PIG IRON.

ROME MERCHANT IRON MILLS,
ROME, N. Y.,
Manufacturers of the best grade of
Bar Iron, Bands and Fine Hoops.
Scrolls, Ovals, Half Ovals, Half Rounds, Hexagon and Horse Shoe Iron. Also from Charcoal Pig a superior quality of Iron branded J. G. All puddled balls reduced by hammer. Orders may be sent to the Mill or to J. O. CARPENTER, our Agent, at 59 John Street, New York.

MARSHALL LEFFERTS,
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MANUFACTURER AND DEALER.
Galvanized Sheet Iron,
1st and 2d Qualities.
Galvanized Wire, Telegraph and Fence; Galvanized Hoop and Band Iron, Galvanized Rod and Bar Iron, Galvanized Nails, Galvanized Chain, Galvanized Iron Pipe.
CORRUGATED SHEET IRON
For Roofing, &c., Galvanized, Plain or Painted.
Best Charcoal, Best Refined and Common
SHEET IRON.
Plate and Tank Iron,
C No. 1, C H No. 1, C H No. 1 Flange, Best Flange, Best Flange Fire Box, Circles.
BOILER IRON
Stamped and Guaranteed.
All descriptions of Iron Work Galvanized or Tinned to order.
Price list and quotations sent upon application.

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SCOTCH AND AMERICAN
PIG IRON,
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ULSTER IRON WORKS,
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A. PURVES & SON,
Corner South & Penn Streets, Phila.,
Dealers in
Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys Steam Engines, Pumps & Boilers Copper, Brass, Tin, Babbit Metals, Foundry Facings. Best Quality Ingot Brass.
Cash paid for all kinds of Metals and Tools.

Agency of
N. M. HÖGLUND'S SONS & CO., Stockholm.
Swedish & Norway Iron
of every description. Stock on hand at Boston, New York and Philadelphia. Importation orders a specialty.
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"AMERICAN" HURDLE FENCE.
[TRADE MARK.]


PORTABLE IRON FENCE.
The designs show several patterns, and how packed for shipping.
A superior Fence for lawns, farms and country places.
23 CENTS PER FOOT.
Call or send for circulars.
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Patentee and Manufacturer,
913 Cherry Street, PHILADELPHIA.

ANCHOR BRAND
AXLES,
For all Styles Carriages and Wagons.
Annual production 180,000 sets.
SHELDON & CO., Auburn, N. Y.

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NEW YORK.

John W. Quincy,
98 William Street, New York.
Anthracite & Charcoal Pig Irons,
Wrought Scrap, Cut Nails, Copper,
BLOCK TIN, LEAD, SPELTER, ANTIMONY, NICKEL, &c

HARRISON & GILLOON
IRON AND METAL DEALERS,
558, 560, 562 WATER ST., and 202, 204, 206 CHERRY ST.,
NEW YORK,
have on hand, and offer for sale, the following:
Scotch and American Pig Iron, Wrought, Cast and Machinery Scrap Iron, Car-Wheels, Axles and Heavy Wrought Iron; also old Copper, Composition, Brass, Lead, Pewter, Zinc, &c.

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Cut Nails
AND
SPIKES.
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BURDEN'S
HORSE SHOES.
"Burden Best"
Iron
Boiler Rivets.
Burden Iron Works, H. Burden & Sons,
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Importer of and Dealer in
SCOTCH AND AMERICAN
Pig Iron,
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OLD METALS.
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Iron Bridge Builders
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HARDWARE, METAL, IRON, RUBBER, SHOE, PAPER AND PAPER-HANGINGS, LUMBER, COAL AND RAILROAD PAPER WANTED.
ADVANCES MADE ON BUSINESSS PAPER AND OTHER SECURITIES.

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BROKER IN IRON
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W. J. Carmichael,
DEALER IN
Iron & Steel Boiler Plate,
Lap Welded Boiler Tubes, &c., &c.
130 & 132 Cedar Street, New York.
Agent for Otis' celebrated Cast Steel Boiler Plates.

Iron.

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W. D. WOOD & CO.'S

PATENT
Planished Sheet Iron.
Patented March 14th, 1865; April 8th, 1873; Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876.
Guaranteed fully equal in all respects to the
IMPORTED RUSSIA IRON,
and at a much less price.
FOR SALE,
by all the principal
METAL DEALERS
In the Large cities throughout
THE UNITED STATES.
And at their Office,
111 Water Street, PITTSBURGH, PA.

JOHN COYNE. A. G. HATRY.
COYNE & HATRY,
Patentees and Manufacturers of
Automatic Nail Selectors,
IMPROVED CUT NAIL MACHINES,
And Nail Factory Supplies.
Works, cor. 20th & Mulberry Sts.,
Office, No. 114 & 115 Water St., Pittsburgh, Pa.

The U. S. Iron and Tin Plate Co.,
OF PITTSBURGH, PA.,
Manufacture to order
Best Refined Charcoal and Polished Sheet Iron,
Taggers Iron and Bessemer Steel Plate,
in quality and size to suit the wants of consumers. Also,
BEST CHARCOAL TERNE PLATES IN SPECIAL SIZES, FROM 10X17 TO 20X30.
Orders solicited. Inquiries promptly answered.
Address P. O. Box 24, Pittsburgh, Pa.
Works at Demmler, Allegheny Co., Pa.
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A. G. HATRY,
Successor to HATRY & FRIEND,
Commission Merchant
AND DEALER IN
Bar, Sheet, Tank, Boiler, Angle, T, and Railroad Iron,
Nails & Spikes, Steel & R. R. Supplies.
WINDOW GLASS, GAS PIPE & BORAX.
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SNOW SHOES.
The only Snow Shoes in the market that absolutely prevent all balling and give universal satisfaction.
Improved Snow Shoe Shapes.
Standard Sizes.
⅜x7-16, 11-16x7-16, ¾x7-16, 13-16x7-16, ⅞x7-16, ⅞x1½ 15-16x1½, 1x1½, 1 1-16x1½, 1 1-8x1½.
STEEL TOE CALKS.
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Wilson, Walker & Co.,
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Manufacturers
UNIVERSAL MILL PLATES
For Bridges, Pipes, &c.
SHAFTING, DRAWBAR IRON, MERCHANT BAR IRON, &c., &c. Also
HEAVY AND LIGHT FORGINGS
Of all kinds
FOR CARS, LOCOMOTIVES AND ENGINES,
Including Drawbars, Axles (either hammered or rolled), Driving Axles, Locomotive Frames, Steamboat Shafts, Cranks, Propeller Frames, Oil Tool Forgings &c. &c.

ZUG & CO.,
Pittsburgh, Pa.,
Manufacturers of
Wheeler's Iron & Steel Combination Shafting,
Under license of the Combination Trust Co., Philadelphia.
This Shafting is superior to any now on the market, and the attention of machinists is particularly called to it and a trial order solicited. Prices furnished on application.

LEECHBURG IRON WORKS.
KIRKPATRICK, BEALE & CO.
Manufacturers of all grades of
FINE SHEET IRONS,
(Refined, Cold Rolled, Show Card, Stamping, Tea Tray, Polished, Shovel.)
TIN AND TERNE PLATES, made with Natural Gas as fuel.
OFFICE, No. 116 Water St., Pittsburgh, Pa. WORKS, Leechburg, Pa.

Est. in 1840 by JOHN ROACH. **ÆTNA IRON CO.,** WM. J. FRYER, Jr Manager.
Manufacturers of every description of Wrought and Cast
ARCHITECTURAL **IRON WORK** FOR BUILDINGS.
86 to 108 Goerck Street, New York.

WROUGHT IRON.		CAST IRON.	
Roofs. Stairs. Floors.	Bank-Vault Doors & Safes.	Fronts for Buildings.	Window Lintels and Sills.
Shutters and Doors, with various fastenings.	Bridles, Truss Plates and Bolts, for Wood Beams.	Columns of every kind.	Lamp Posts. Tree Boxes.
Rolling Shutters.	Anchors, Clamps and Ties for mason work.	Arch Girders, with tension rods—improved shape.	Chimney Caps. Coping.
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Fire-Proof Ceilings and Partitions. Lathing.	Gratings, for Areas.	Cornices.	Coal Covers. Walking Plates.
Sky-Lights. Floor-Lights.	Corrugated Sheet Iron, galvanized or plain.	Capitals and Bases.	Railings and Gates, for dwellings, offices and cemeteries.
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		Shutter Eyes. Turn-Buckles.	

MOULDING SAND
Fire Sand and Clays.
FOUNDRY FACINGS
Shovels, Riddles, Brushes, &c.
WHITEHEAD BROS.
AMERICAN FACING CO.
WM. WHITEHEAD, Treas., 517 W. 15th St., New York.

Bonnell, Botsford & Co.,
Iron, Nails & Spikes.
YOUNGSTOWN, OHIO.

C. KANE,
Dealer in
IRON and STEEL.
Old Rails, Wheels, Axles, Springs, Scrap, Turnings, &c.,
PIG IRON, BLOOMS AND BAR IRON.
Duquesne Way, near 6th Street, PITTSBURGH.

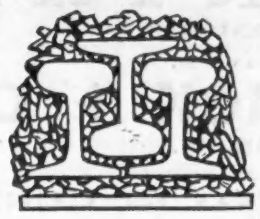
New Patents.

We take the following abstract of new patents, recently issued, from the official record:

METHOD OF MANUFACTURING AND PILING IRON.

209,470.—*To Edward B. Edwards, Columbia, Pa.*—October 29, 1878.—1. As an improvement in the mode of utilizing old Bessemer steel rails, fag ends, or steel scrap, preparing rails, ends or scrap by piling the same in an open pile, with pieces of wrought iron, upon a wooden base-board forming part of the pile, subjecting the pile to heat in the bed of a furnace, reducing the same to a bloom, and converting the latter by rolling or hammering into bars, plate or other forms of malleable iron.

2. In the manufacture of iron from steel rail ends or scrap, the pile, consisting of a wooden base and the layers of steel-rail ends or steel pieces packed between with



layers and pieces of wrought-iron or scrap of the same, the whole being covered on the sides, ends, top and bottom with pieces or scrap of wrought iron, and supported on said wooden base.

3. The mode of converting old steel-rail ends or steel scrap into malleable iron, consisting in enveloping with and packing between said rail ends or steel scrap wrought-iron scrap, to prevent burning and running of the steel, then heating the same, and thereby effecting an intimate mixture of the wrought scrap and steel in the interior of the mass, as well as in the superficial portion, and finally hammering or rolling the mass.

APPARATUS FOR THE MANUFACTURE OF ILLUMINATING GAS.

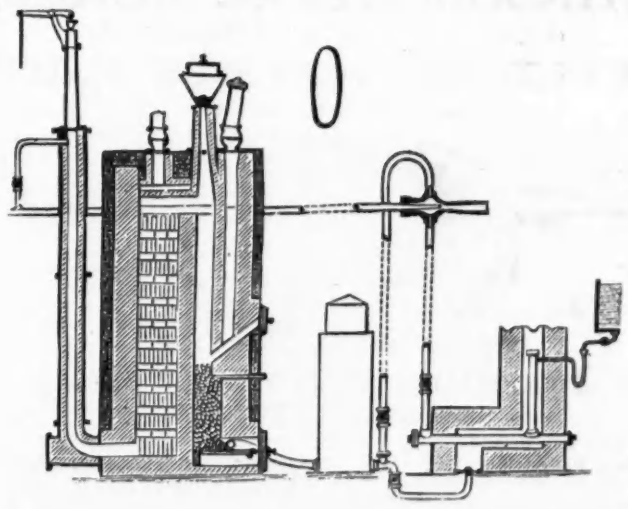
209,620.—*To Myron H. Strong, Brooklyn, N. Y., assignor to Lemuel W. Serrell, trustee for said Strong, Sidney Cornell, Henry W. Pierson, and Walter E. Lawton.*—Nov. 5, 1878.—Water gas is made by the decomposition of steam in contact with incandescent carbon and stored in a holder. From here part of the gas is conducted to a furnace and burned under retorts, in which olefiant gas is made from oil, and part of it is conducted in the eduction-pipe for the olefiant gas, and the two gases are mixed, by a steam jet, in proper proportion to form an illuminating gas.

1. The combination, with the decomposing chamber for making non-luminous gas, of a holder for the same, a retort for making olefiant gas, a supply tank for liquid hydrocarbon to the retort, a gas pipe and burner for heating such retort, and connecting pipes and a steam injector for mixing the gases.

2. The combination of a decomposing chamber for making non-luminous gas, a holder for storing gas, a retort for the production of olefiant gas, an apparatus for supplying liquid hydrocarbon to retort, a burner or burners for heating retort by the combustion of non-luminous gas, and means for mixing the non-luminous gas and the olefiant gas in the proper proportion for producing the illuminating gas.

ROLLS FOR REDUCING OLD IRON RAILWAY RAILS.

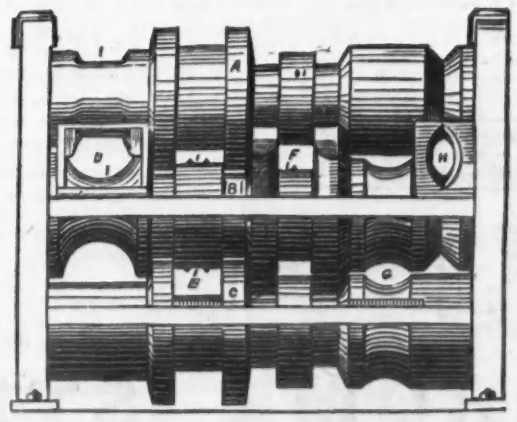
209,743.—*To Burroughs P. Brunner, San Francisco, Cal.*—Nov. 5, 1878.—The rolls A B C, provided with the passes D E F G H



and spurs I, in combination with the holding guides, J, having the irregularly-shaped interior.

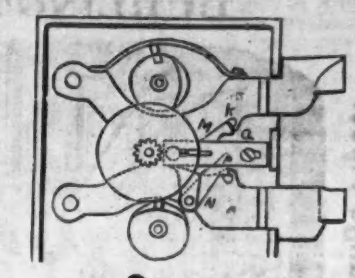
TIME LOCK.

210,070.—*To Jacob Weimar, New York, N. Y., assignor to Herring & Co., same place.*—Nov.—19, 1878.—1. The combination



tion of the bolts, the sliding bar Q, and cam pieces M N.

2. The combination of the bolt studs *k*,

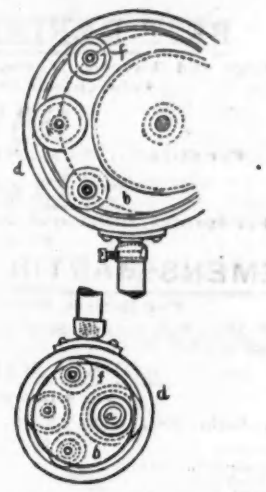


the cam pieces, the sliding bar and time wheel.

3. The combination of the time wheel, sliding bar, cam pieces, and bolts with the operating spindles of a permutation lock or locks.

ANTI-FRICTION ECCENTRIC.

210,969.—*To Mendel Seharfberg, Vienna, Austria, assignor of one-third his right to Marcus Lowendahl, same place, and Max Gutman, Dresden, Saxony.*—Dec. 17, 1878.—1. The combination, with the eccentric-ring *d*, of the internal wheels or rollers, the ar-



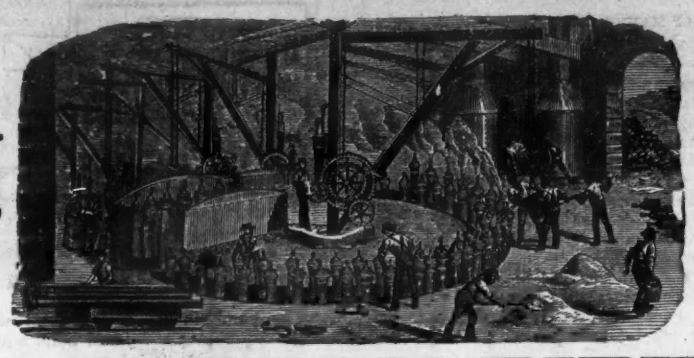
A telegram from Brussels, Belgium, dated April 17, states that by an explosion of fire-damp in the Agrappe coal pit, near Mons, Belgium, the woodwork of the shaft caught fire and fell in. There are 240 men in the mine, and there appears to be scarcely a hope of rescuing any of them.

The full prospectus of the new French Cable Company is published. The capital consists of 42,000,000 francs, in shares of 500 francs each. The definite organization was made March 27, 1879. The president is M. Pouyer-Quertier, and the New York holders are represented by Mr. E. I. de Brugiere and Gen. Z. C. Deas. Seven lines will be established, and the cables will be made and laid by Siemens Brothers.

McNEALS & ARCHER,

BURLINGTON, N. J.

Flange Pipes.



General Foundry Work.

CAST IRON PIPES

FOR WATER AND GAS.

ESTABLISHED IN 1848.

SINGER, NIMICK & CO.,

PITTSBURGH, PA.

MANUFACTURERS OF ALL KINDS OF

HAMMERED AND ROLLED

STEEL,

Warranted Equal to any Produced.

BEST REFINED TOOL CAST STEEL

For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives, Cold-Chisels and Machinists' Tools generally.

SAW PLATES

For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

Sheet Steel

For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws, Stamping Cold, &c., &c.

SIEMENS-MARTIN (Open-Hearth) PLATE STEEL

For Boilers, Fire-Boxes, Smoke Stacks, Tanks, &c.

☞ All our Plate and Sheet Steel being rolled by a Patented Improvement is unequaled for surface finish and exactness of gauge.

ROUND MACHINERY CAST STEEL

For Shafting, Spindles, Rollers, &c., &c.

File, Fork, Hoe, Rake, R. R. Frog, Toe-Calk, Sleigh-Shoe and Tire Steel, &c.; Cast and German Spring and Plow Steel.

"Iron Center" Cast Plow Steel,
"Soft Steel Center" Cast Plow Steel,
"Solid Soft Center" Cast Plow Steel.

Finished Rolling Plow Coulters with Patent Screw Hubs attached.
Agricultural Steel cut to any pattern desired.
Steel Forgings made to order.

Represented at 59 BEEKMAN ST., NEW YORK, by

HOGAN & BURROWS, Gen'l Agents for Eastern and New England States.

MIDVALE STEEL WORKS,

CRUCIBLE AND OPEN HEARTH STEEL.

TIRES AND AXLES

OF EVERY DESCRIPTION.

TOOL, MACHINERY AND SPRING STEEL CASTINGS AND FORGINGS.

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WAREHOUSE: 12 N. 5th St., Philadelphia, Pa.

ESTABLISHED 1817.

A. WHITNEY & SONS,

PHILADELPHIA,

CHILLED RAILROAD WHEELS

For every kind of service, including *Street, Mine and Lumber Tramways.* Wheels furnished in rough bored or on axles. Chilled castings made to order.

The Standard Steel Works.

LOCOMOTIVE AND CAR WHEEL TIRES,

Manufactured from the celebrated OTIS STEEL.

BRAND

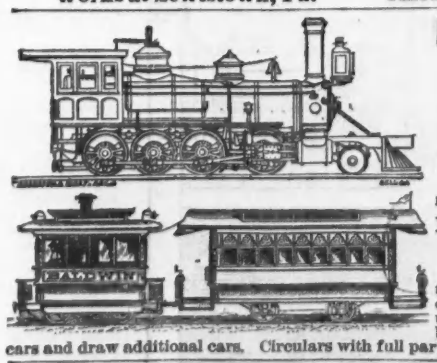
⚓ STANDARD. ⚓

Quality and efficiency fully guaranteed. Prices as low as any of the same quality.

We manufacture

Heavy and Light Forgings, Driving and Car Axles, Crank Pins, Piston Rods, Etc.

Works at Lewistown, Pa. **Office, 220 S. 4th St., Philadelphia, Pa.**



BALDWIN LOCOMOTIVE WORKS,

BURNHAM, PARRY, WILLIAMS & CO., Proprietors,

Philadelphia, Pa., U. S. A.,

Manufacturers of

LOCOMOTIVE ENGINES

of every Description.

Catalogues, photographs and estimates furnished on application of customers.

NOISELESS STEAM MOTORS,

For city and suburban Railways.

These machines are nearly noiseless in operation; show no smoke with the use of anthracite coal or coke as fuel, and show no steam whatever under ordinary conditions of service. They can be run at two or three times the speed of horse cars and draw additional cars. Circulars with full particulars supplied.

CHROME STEEL

WAREHOUSE.

Address JOHN W. QUINCY, Manager, 98 William St., N. Y.

This Steel is made from Chromium and Iron, and is remarkable for Strength, Durability and Uniformity. Send for Circular, where the proof will show it does 25 to 75 per cent. more than other cast steel. It is adapted to all kinds of work where cast steel is used. Chrome Steel Castings from 25 to 500 lbs. to order.

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MANUFACTURERS OF

BAR IRON, NAILS, RAILROAD SPIKES, FISH BARS AND BOLTS BRIDGE AND CAR BOLTS, AND FORGINGS GENERALLY.

ROANE IRON COMPANY,

Manufacturers of and Dealers in

Pig and Railroad Iron.

CHATTANOOGA, - - - - TENN.

WASON CAR & FOUNDRY COMPANY,

Chattanooga, Tenn.,

Manufacturers of

RAILWAY FREIGHT CARS, Car Wheels and Castings.

TENN. COAL & RAILROAD COMPANY,

A. M. SHOOK, General Manager, - - Tracy City, Tenn.

Proprietors of the Sewanee mines, capacity of 50,000 bushels of coal and coke per day.
Several important institutions of learning, including the University of the South, also the celebrated Beersheba Springs, are located upon the line of this Railroad.
Being also the proprietors of several extensive tracks of very fine lands, offer special inducements to colonies. Communications addressed to the General Manager will receive prompt attention.

T. J. BROWN,

Rockwood, Tenn.

Miner and Contractor of Fossiliferous Ores.

A superior article delivered at low figures at any furnace within the district or at any point on the Ohio River. Refer to Roane Iron Co., Chattanooga Iron Co., or S. B. Lowe, Chattanooga.

S. B. LOWE,

Pig Iron, Storage & Commission.

Dealer in Charcoal and Coke Pig Iron for Foundry, Forge or Car Wheel purposes.

Chattanooga, Tenn.

LIGHT GRAY IRON CASTINGS

MADE A SPECIALTY BY

TAYLOR & BOGGIS,

65 to 73 Central Way,

CLEVELAND, OHIO.

Having extensive machine shop connected with foundry, we are enabled to fit up all kinds of light Hardware or patented articles. Correspondence solicited.

IRON AND STEEL DROP FORGINGS

All shapes, small and large, including

Gun, Pistol, Wrench Bars, &c. Also, Die Sinking. Manufacturers also of Bricklayers', Moulders' and Plasterers' Tools, Saddlers' Round and Head Knives.

WILLIAM ROSE & BROS.,

36th & Filbert Sts., West Philadelphia.

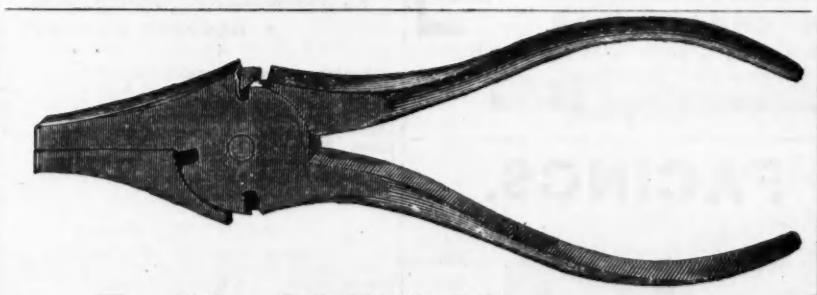
RICHARD P. PIM,

MANUFACTURER OF

MALLEABLE AND GRAY IRON CASTINGS

For Car, Carriage and Tinsmiths' Hardware.

Corner Taylor and Buttonwood Streets, - WILMINGTON, DEL.



J. M. KING & CO.,

WATERFORD, N. Y.,

Manufacturers of the BUTTONS PATENT

"WIRE CUTTER AND PLIER COMBINED."

Specially Adapted for Use on Wire Fence.

Also Manufacturers of

Blacksmith and Machinists' Stocks and Dies, Plug and Taper Taps, Hand, Nut and Screw Taps, Pipe Taps and Reamers.

Price List on application. Established by DANIEL B. KING, 1829.

FENCE WIRE.

Nos. 6, 7, 8, 9 and 10, for using plain.
Nos. 12, 12½ and 13, for making into Barb Wire.
No. 20, for Harvester Wire.

Send for prices and samples.

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PITTSBURGH, PA.

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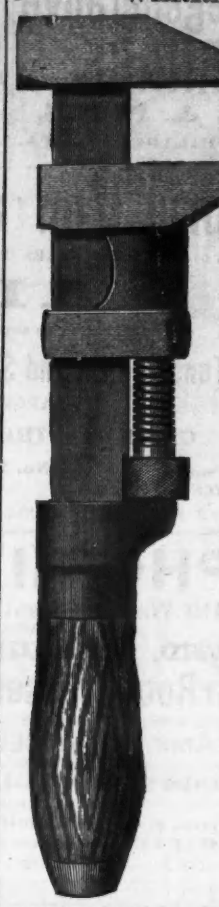

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Manufacture of Wrought Iron Wheels.

Mr. E. von Tarlo describes, in the *Annalen für Gewerbe und Bauwesen*, a method of manufacturing wrought-iron wheels from one piece, which, he states, is employed in Belgium. The iron is first given the shape shown in Fig. 1, then that of Fig. 2, a hole being made, into which a rod is fitted. In this state the wheel is taken to a peculiar rolling mill, the main features of which are shown in Fig. 4. It consists of two conical rolls, each mounted on a separate shaft, which is rotated by means of conical gearing, and which is placed in such bearings that the conical rolls at their extremity can be approached by moving them, as indicated by the arrows. The wheel to be finished rests with its axle in two bearings, and it is then exposed to the action of the conical rolls, which compress the material so that its diameter increases. In order to make allowance for this, the position of the bearings of the wheel are adjustable. The circumference of the wheel is worked by a cylindrical roll. Fig. 4 shows the rolling mill as required for finishing the shape of wheel, having the section exhibited. If the usual shape (see Fig. 3) is required, the surface of the roll is turned accordingly.

This method, it will be observed, is very

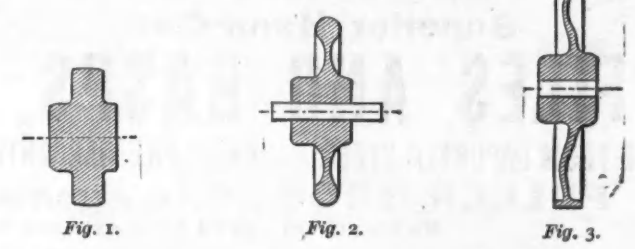

Fig. 1. *Fig. 2.* *Fig. 3.*

simple, but as yet it has been very difficult to produce wheels free from flaws, as they show imperfect parts which must be welded subsequently. Nevertheless, it is to be expected that by improvements this method will produce uniformly reliable results.

Chinese Labor for the South.

The project of introducing Chinese labor into the South, to work in the cotton, sugar and rice fields in place of the emigrating negro, is turning out to be something more than a momentary fancy. It has already taken a very practical business form. The planters of Madison parish, Louisiana, have placed themselves in communication with the Six Companies at San Francisco, with a view of ascertaining whether a supply of that kind of labor is attainable, and if so, on what terms. They likewise appointed a special agent to furnish the

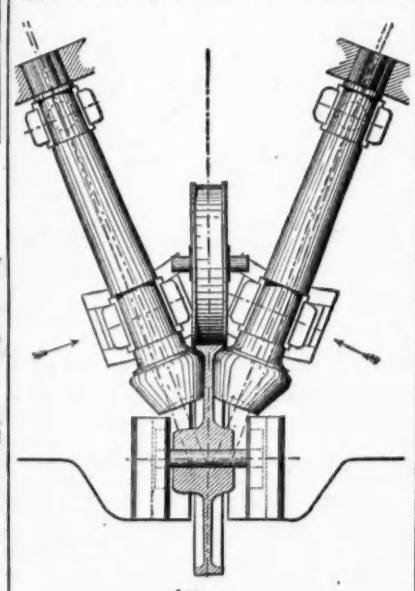

Fig. 4.

companies with a full description of the soil, climate, &c., of their section of the country, its resources, &c., as well as the qualifications necessary to the kind of work which will be required of the Chinese in the event of their coming there. The response of the Six Companies was to this effect—that at present it is impossible to obtain any considerable numbers of Chinese laborers for field work in Louisiana, inasmuch as the companies have not the requisite authority over their people, as they do not bring them to the United States nor make contracts to let out their labor to white men or corporations; the Chinese Six Companies are simply benevolent societies, and nothing more. The high rates paid the Chinese for their labor in California, namely, from $20 to $40 per month, which are the ruling prices for skilled labor, precludes the idea of emigration to the South. Cheap labor is also scarce on the Pacific Coast; and the only way, therefore, by which the Southern planters can obtain the class of laborers they desire, is to send an agent to Hong Kong and there hire and contract for a sufficient number of Chinese to justify them in chartering a ship direct for New Orleans. If the Chinamen thus hired are well and kindly treated, the Six Companies have no doubt they will quickly inform their friends in California and in China of the fact, and advise them likewise to come on to the South. In Hong Kong, contracts can be made with the Chinese for a term of from three to five years, at wages from $8 to $10 per month. Furthermore, "such contracts they will faithfully keep, if reciprocated in kind. This class of labor is entirely free, and many go and come with as much freedom and as far as any European emigrant to the United States. The Chinese are the best laborers in the shop, field and house, as they are kindly disposed toward their employers, sober and honest; but the demand for them by far exceeds the supply, as there is not one single idle Chinaman in the State of California." The agent of the Southern planters seems to have lost no time in informing them of the result of the conference, and, in a statement to the San Francisco *Chronicle*, he announces that the suggestion relative to the sending to Hong Kong and chartering a ship will very shortly be acted upon, as the planters of Louisiana, Alabama, Mississippi and Georgia are becoming greatly alarmed at the rapid exodus of the negroes, declaring that in many portions of these States no negroes can be had to plant crops for the coming year, and they are anxious to test the efficacy of the Chinese as auxiliaries in the cultivation of rice, sugar, tobacco and cotton. Steamers can be chartered at Hong Kong for New Orleans at very low rates for this new "passenger traffic;" and if it is once fairly begun, we need not be surprised if, in a short time, it is productive of very extraordinary results—the wholesale migration of one race from South to North in our own country, and the emigration of yet another race to fill the vacuum. That the Chinaman would make a capital field hand is universally admitted, and if once he obtains a comfortable foothold in the Gulf States, he will be likely to "stick." Among other advantages he will have over the negro, is his exemption from politics, with no desire to combine the business of cotton and sugar planting with the solution of profound problems in government and legislation. The politicians will not be able either to use or abuse him; and it will be strange, indeed, if with his exemplary habits of industry he does not in the course of time effect a marvelous transformation in Southern industries, and one that may affect to a very important extent the commercial status of the leading Southern staples. As for the negro, who is thus surrendering his place to the Asiatic, it is hardly worth while to discuss the future that is in store for him in the higher latitudes to which he is flocking. He can never compete with the white labor which he will find occupying every field of enterprise wherever he goes, and where his position in the social scale, in all human probability, will never under any circumstances be much higher than it is already. In the Southern Atlantic States he seems to be free from the Kansas infection which has caught the field hands of Louisiana and Mississippi, and in so far as he is contented and prosperous; but how long he is to be exempt from the contagion which is producing such curious results in the lower Mississippi country, is a matter for the future to determine.—*N. Y. Bulletin.*

Railroads and Telegraphs in Japan.—The government of Japan seems to be particularly distinguishing itself in the extension of its telegraph system. There are now no less than 125 telegraph stations and 5000 miles of wire in operation, 1000 miles more in course of construction, and still further extensions are contemplated. The telegraph insulators made in a village called Imari, in the province of Hizen, are of such an excellent quality that orders for them have been sent from Europe. It is the first aim of the government to provide good highways in all parts of the empire before entering upon any general system of railroad building; but on the 26th of July, 1876, a line of railroad 48 miles in length was completed between Hiogo and Kioto, and now a line has been commenced between the latter place and Ostu, and is expected to be completed in three years, at a cost of about $1,000,000. The railroad between Hiogo and Kioto is constructed of the best imported material, and passes through one of the richest and most beautiful agricultural districts in Japan. Seven trains leave and arrive at Hiogo daily, and the passenger and freight traffic are constantly increasing. The iron bridges of this road, one of which is 1300 feet in length, are a credit to the government and contractors.

The Madeira and Mamore Railway.—In the case of the English bondholders against the Madeira and Mamore Railway Company, a suit involving nearly $4,000,000, which has been pending 18 months, the court in London has nonsuited the bondholders and ordered the payment of the contractors' certificates. The contractors, as is well known, are Messrs. P. & T. Collins, of Philadelphia. This decision removes the chief obstacle to the active prosecution of the work upon the railroad. The fund of $3,700,000 thus released, together with the $2,000,000 guaranteed by Brazil, is more than sufficient to pay the entire cost of the road under the present contract. As the line of the road is entirely in Brazil, and not in Bolivia, no concession of the latter country is required for the purpose of building the railroad. The contract for the building of the railroad, which is to run from a point just below the rapids of the Madeira River in Brazil to the point of navigation on the Mamore River, a branch of the Madeira, fixes the price of construction at $29,500 per mile of road completed up to the full (estimated) length of 180 miles. Upon any length of road beyond this, only $26,000 per mile is to be paid.

A New Salt Field.—From a communication to the *Mining Journal*, it appears that the Cleveland district of England, already the home of an enormous iron industry and the prospective center of steel manufacture, is about to add salt mining to the industries contributing to its prosperity. Borings have disclosed the fact that a large area of the district is underlaid by a 100-foot deposit of rock salt, which is reached at Middlesborough at a depth of about 1200 feet.

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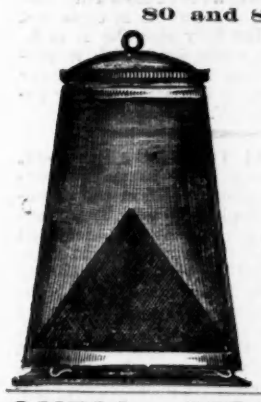

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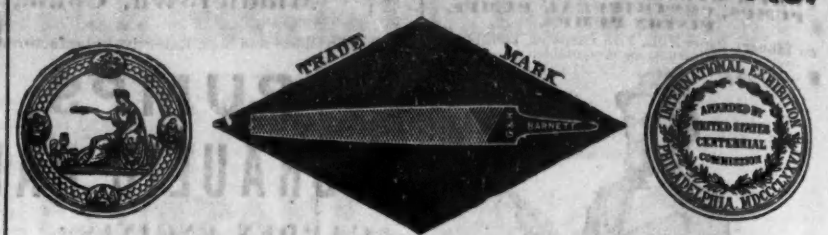

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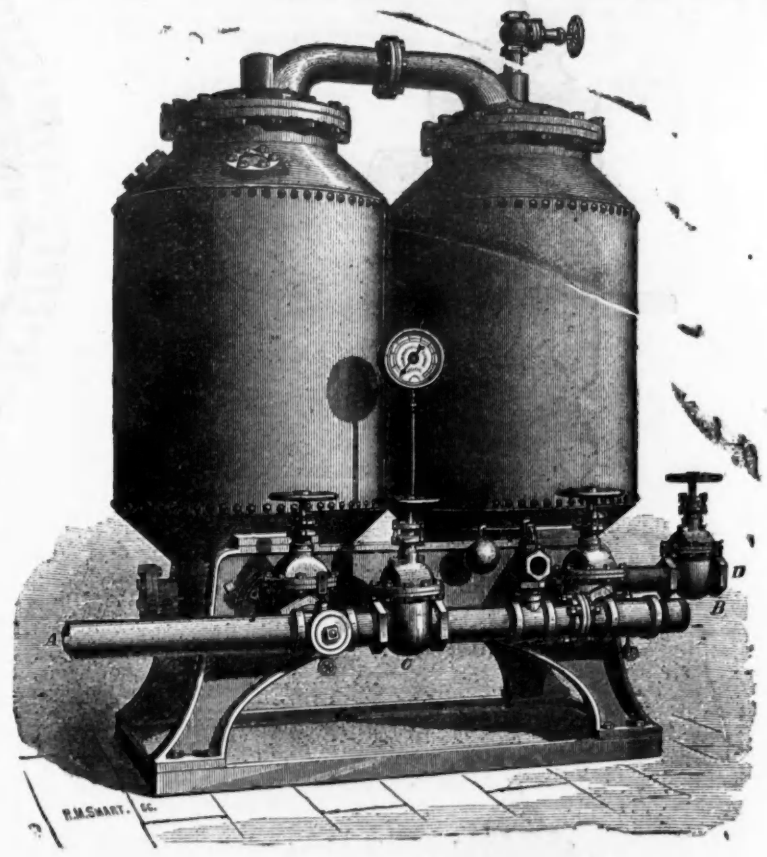
Feed Water Filter.

There is hardly any subject more important or interesting to steam and water users and to manufacturers generally, than that of the purification of water, whether upon a large or a small scale. Messrs. Babcock & Wilcox, of 30 Cortlandt street, New York, have recently designed a new filter, which is intended for removing the impurities in water used for feeding boilers. The engraving represents a filter suitable for handling a large quantity of water, being of the size necessary for a 1000-horse-power boiler. This filter is arranged to combine, in a measure, the principle of washing out the filtering material and of throwing away those portions which cannot be readily cleaned by reversing the current of water. The filter consists of two cylindrical vessels, each filled with the filtering material, but of different degrees of fineness. In the first chamber coke is used, varying in fineness from the bottom toward the top, the water rising upward through it. At the top of this chamber there are some inches of animal charcoal, which is kept from rising by means of a layer of asbestos fiber and a grating. The water is, as we have seen, passed into the bottom of this vessel first and rises upward through the coke and animal charcoal. As would be expected, the greater portion of the impurities are deposited in the lower portion of the chamber. From the top of this chamber it passes by a pipe across to the top of the second chamber, as shown in the engraving, and descends through it. This second chamber is filled with animal charcoal, which rests upon a grating at the bottom covered with a blanket. Here the action of the charcoal is very similar to that of an ordinary filter bed, which has to be cleaned by the removal of the surface material that has become foul. The chamber has been arranged to hold a large quantity of the charcoal, so that it may be repeatedly cleaned by removing the surface before the material will all be exhausted. The removal is effected through the hand holes provided upon the upper parts of the filtering chambers; two of these hand holes are shown in the cut. When it becomes necessary to remove the whole of the filtering material, bonnets covering the bottoms of the chambers can be removed, and the whole contents allowed to drop into the drip-pan which forms the base. The new charges are supplied from above. The coke charge, which requires the most frequent renewals, is inexpensive. The filtering is done under pressure. A very neat device is used to ascertain whether the filter is working properly or whether it needs cleaning. A pressure gauge is attached to show the difference in head necessary to force the water through the filter; this of course increases as the filter becomes foul, and is shown by the gauge. In the filter shown in the drawing, the feed water enters the pipe B and escapes through A. A by-pass valve is shown at C, by means of which the water can be allowed to flow directly to the boilers, or to a tank, as may in some instances be necessary. The first chamber may be cleaned by a reverse current of water passing through it, but it is preferable to use steam directly from the boiler, which blows out the water and the impurities together. A steam pipe for this purpose is shown at the top of the chamber. This can be done frequently while the second vessel, having only comparatively pure water to handle, requires only occasional attention. The mud valve for the escape of the impurities washed from the filter is shown at D. A safety valve, as well as small cocks for sampling the water both before and after filtration, are shown. The importance of a means for readily cleaning and frequently renewing the filtering material, has not been in the past as generally understood as it should have been. For example, take the following figures in regard to Croton water, which is probably as free from sediment as almost any of the best drinking waters of the country. We find that a 100-horse-power boiler evaporates, say, 30,000 pounds of water every 10 hours, or 300 tons per month, and in this water there is no less than 88 pounds of sediment, or nearly 100 pounds of sediment per month for a 100-horse-power boiler. In some of the more turbid spring waters this would be 2000 pounds instead of 88. A moment's thought shows that such a quantity cannot be allowed to accumulate in the filter without rapidly destroying its action. We have seen specimens of very dirty water, far too impure for safe use in boilers, filtered by this apparatus, and the sediment removed to such an extent as to make them harmless, and in some instances almost suitable for drinking purposes. With very dirty water, if it is to be made perfectly colorless and left suitable for drinking, it is necessary to use a much larger apparatus than would be needed to render the same water fit for boiler feed.



FEED-WATER FILTER, BY MESSRS. BABCOCK & WILCOX.

The Protection Movement in France.

A correspondent of the *Ironmonger*, writing from Paris, says:

Great agitation prevails in manufacturing circles in France at the present moment over the question of commercial treaties and the revision of existing tariffs. Petition after petition is laid on the table of the Chamber of Deputies, and deputation follows deputation to lay the case—for or against—before the President. Hitherto the principal opponents of free trade had been the ironmasters, spinners, &c., in a few departments; but now their ranks are likely to be swelled by a strong contingent of agriculturists, especially from the Northern departments. The enormous importation of American wheat, and its sale at prices far lower than obtain, or are likely to obtain, for the French staple, has fairly frightened the French growers, who are fully alive to the fact that, once the Yankee gets a footing anywhere, he is likely to keep it. Many other causes, however, tend to produce despondency in their minds. Agricultural laborers are gradually abandoning work in the fields to flock to the neighboring manufacturing towns, attracted by higher wages; then, again, landed property is heavily weighted with rates and taxes of every kind, the proportion being nearly 44 per cent. of the income, whereas manufacturers pay less than 20 per cent. to the state. The iron interest is directly interested in the matter, for a diminution of agricultural pursuits in France—wheat growing more particularly—means the gradual closing up of one of the best markets for English agricultural machinery and implements. The Chambers are at last discussing the laws concerning M. de Freycinet's long-talked-of scheme of public works, and some few bills for new railways have been passed. The Senate has voted that, pending a long-term commercial treaty with England, steel goods shall be admitted at the duties obtaining under the most-favored-nation clause, instead of those in force under the general tariff. The following are the rates on goods coming under the conventional tariff:

	Francs.
Steel bars and hoops, 100 kilogs.	9
Steel sheets or brown plate, rolled hot, over ½ mm. in thickness, 100 kilogs.	11.25
Ditto, ½ mm. in thickness or under, 100 kilogs.	15
White steel sheets or plates of every description, rolled cold, 100 kilogs.	15
Steel wire, including white steel cords for instruments, 100 kilogs.	20
Carriage, wagon and locomotive springs, 100 kilogs.	11
Other springs, polished, filed, fitted or not, weighing over 1 kilog., 100 kilogs.	15
Ditto, weighing 1 kilog. or under, 100 kilogs	20
Steel tools, with or without handles, 100 kilogs.	20
Household utensils and other steel articles not enumerated, 100 kilogs.	20
Iron ships built in the contracting states, unregistered or sailing under the flag of those countries, per ton	2
Iron hulls, "	2

All manufactured or unmanufactured articles, including steam engines and parts of engines entering into the construction, gearing, fitting out and preservation of sailing or steam trading vessels, will be admitted free of duty, on due proof being given within a twelvemonth that said articles are destined to the above-mentioned purposes.

The Minister of Finance is empowered to refund to importers of the above description of goods the difference between the duty levied before and after Dec. 31, 1878, on proper proof being furnished by importers that such goods were on their way or were bought prior to Jan. 1 of the present year.

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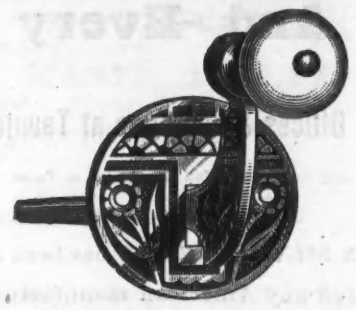

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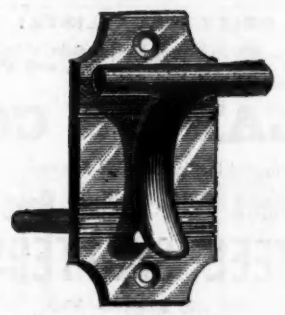

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Nos. 133 and 135. (Half Size.)

IMPROVED LEVER DOOR BELLS.

Patented February 25, 1879.

No.	Size.	Description.
30	3½ inch.	Plain Bell Metal.
31	3½ "	" " " Nickel-plated.
32	3½ "	Fancy "Kahala" Bronze (see cut).
33	3½ "	" Real Bronze.
34	3½ "	" Nickel.plated.
40	5 "	Plain Bell Metal.
41	5 "	" " " Nickel-plated,
42	5 "	Fancy "Kahala" Bronze.
43	5 "	" Real Bronze.
44	5 "	" Nickel-plated.

Nos. 42, 43 and 44 are same pattern as Nos. 32, 33 and 34, differing only in size.
Packed complete with Screws. One-twelfth dozen in a box.

LEVERS FOR IMPROVED DOOR BELLS.

No.	Length of Plate.	Width of Plate.	Description.
130	4¼ inches.	2 inches.	"Kahala" Bronze, with T Handle.
131	4½ "	3 "	" " " "
132	2¼ "	2¼ "	" " with Porcelain Knob.
133	4¼ "	2 "	" " " " "
134	2¼ "	2¼ "	Electro-plated, with Porcelain Knob.
135	4¼ "	2 "	" " " "
136	4¼ "	2 "	Real Bronze, with T Handle.
140	7 "	2 "	" " " "
150	3 "	1½ "	Nickel-plated, " "

Packed complete with Screws.

One-sixth dozen in a box.

A New Miner's Lamp.

Messrs. Lee Brothers, of Plymouth, Pa., are manufacturing a new and improved miner's lamp, of which we give an illustration. The prominent feature of this lamp, and the one in which its manufacturers claim that it is superior to all others, is in the construction of the cover and the hinge. In the ordinary lamp the cover consists of a rim and cap piece, the hinge being formed by means of a strip of tin bent around the rim and soldered to the top of the cover. This method requires the use of four separate pieces and the solder necessary for fastening them. The soldering of the hinge strip upon the exposed top of the lamp has always been a fruitful source of trouble to drivers, car runners and others who have to carry a large flame, because from the heat the strip was constantly burning off. In the improved form of lamp the cover and the other parts necessary to form the hinge are stamped from a single piece of tin, as may be seen from the engraving—rim, cap and hinge-piece all being in one. No solder is of course necessary. This renders the cap much stronger and more durable, while it greatly improves the finish and appearance of the lamps. The lamps are made with three different sizes of spouts, in order to meet a variety of wants.

A MEW MINER'S LAMP.

The Transmission of Power.

Mr. Ewing Matheson has published in *Iron* a series of articles on the transmission of power, which are replete with practical data and suggestions of value to manufacturers and engineers. In comparing the respective advantages of the different means of transmitting power, the circumstances to which regard must be had, and which will, indeed, determine the choice to be made, are various. First, there is the nature of the motive power, with which one system of transmission rather than another may accord; secondly, there is the distance to be traversed and the obstacles that intervene, which may render certain methods of transmission unsuitable or impossible; thirdly, the power may either have to be transmitted in the gross or distributed; and, fourthly, there is the nature of the machine or process to which the power is to be ultimately applied, and to which one system of transmission may lend itself more readily than another.

The transmission of power by steam is, in the great majority of cases, confined to the few feet distance between a boiler and the cylinder of a steam engine. It is, however, possible, with the assistance of proper application of non-conducting materials, to convey steam 2000 feet with a loss of only 5 pounds pressure. It is advisable to do so in those cases when small engines are required in situations where boilers would be inconvenient, or their presence would greatly increase the rate of fire insurance. The expediency of transmitting power by steam depends a good deal on the manner in which the power is to be utilized. If a rotary motion is desired, an engine will generally be more effectually worked by steam than by water, if a boiler be available within 2000 feet and there be no obstacles in the way of the steam pipes; for though water is often used for transmitting power long distances, it is, if applied to rotary engines, generally confined to those of small capacity. If, however, power is required for direct-acting machines, such as cranes, presses, punching machines or riveting machines, then water would compare more favorably with transmitting steam.

The modern tendency toward higher pressures of steam than formerly, allows more margin for a reduction in pressure during transit, but the unremunerative consumption of fuel which a reduction implies is none the less. There is always the inconvenience that the loss in transit reduces the dryness of the steam and increases the liability to priming. The superheating of steam by a second process after it leaves the boiler, is directed toward this evil and neutralizes some of the effects of long transit. The question of conveying steam long distances is simplified if, by care in the arrangements, it can be resolved into one merely of expenditure of fuel, against which can be set the conveniences which in any particular case are obtained.

Hydraulic pressure was for many years after Bramah's time confined to presses where great force was only required to be conceutrated slowly; the process of pumping to accumulate the small units of force occupying too long a time for general purposes, unless steam engines and pumps of great magnitude were provided, the expense of which would outweigh the benefits sought. Armstrong's invention of the accumulator, however, overcame this difficulty and opened out a wide field for the application of power concentrated and transmitted by water. By the accumulator system the pumps, instead of forcing water directly into a press cylinder, are applied to the forcing up of a loaded plunger, which, in pressing upon the water pumped against it, acts as a substitute for an elevated reservoir. The pipe which connects the pump to the accumulator is connected also with the machine in which the force is to be utilized, and when communication is open between them, pressure from the falling accumulator is instantaneously conveyed to the machine, and so far as its own stored-up energy will allow, completes the desired operation. Hydraulic power in connection with the accumulator system is valuable in those cases where only great intermittent work is required from a machine, or where numerous small operations must be performed at irregular intervals. The additional convenience that the power can be conveyed long distances—for the accumulator and pumping engine may be situated a mile or more from the power-receiving machine—greatly increases the usefulness of the system.

The non-compressibility of water, by which many of the more important operations of hydraulic machines are rendered impossible, and which allows pressure applied to one end of a column of water or hydraulic rod, to be given out at the other and distant end with but little diminution, is a cause of inconvenience in some respects. Directly the pressure from the original source—gravity, force pumps or other—is withdrawn, the water is powerless, for it has no self-contained or elastic force of its own like steam or compressed air.

In theory, the pressure which may be conveyed by water would seem unlimited, but in practice the limit is reached at a point much below that at which metals would be actually compressed. Hydraulic machines in all cases require good material and workmanship, but where the pressure exceeds 6000 pounds to the inch, the liability to derangement of parts rapidly increases; and although by using specially-made machines higher pressures than 6000 pounds per inch may be attained, the risk of packing leathers failing, or of cylinders, pumps and valves bursting, increases.

In the use of compressed air for transmitting power, it should not be lost sight of that there are considerable losses by the absorption of power through the production of heat in compressing, by leakage, &c., and that the freezing of exhaust ports, &c. prevents its use expansively by cutting off before the end of a stroke. The most favorable opportunity for using compressed air is for transmitting power derived from some natural or gratuitous source, such as a waterfall or rapid, or from water pumped up by a windmill; and in many such cases where the power is abundant, the loss in transmutation which has been referred to is of little or no consequence. It has also the advantage over steam or water, that it is portable and can be conveyed in detached vessels long distances from the source of power.

In comparing the respective merits of different transmission systems, it will be found that compressed air cannot be employed advantageously for conveying great power. The difficulties of transmuting and transmitting mechanical force in this way increase with the pressure. The minimum of loss is obtainable by working at a low pressure; but as this involves cylinders of proportionately large diameter, the advantage afforded by this condition is limited. In fixed engines there is not much difficulty in having large cylinders, and a pressure of 20 to 30 pounds is not unusual, but in a portable machine like a rock-drill, where powerful and rapid strokes are generally wanted, the machine would be too heavy and cumbersome if made for low pressure. In exceptional cases, where rock-drills have to work against a head of water, a pressure as great as 120 pounds to the inch is often found necessary. It is, however, for machines detached from the compressor, and therefore needing a store of power, that the great pressure is required: and the density which affords 1500 pounds and even 2000 pounds to the inch, could not without great difficulty be maintained for transmission in pipes. For conveying power a considerable distance, 70 pounds per inch may be taken as the maximum of modern practice; and as, moreover, a speed greater than 4 feet per second involves an increased loss by friction, it is obvious that for transmitting great power, pipes of a capacity far beyond those used for transmitting equal power by high-pressure water would be required.

The transmission of power by connecting rods is, for general purposes, limited to very short distances. Long connecting rods have found their chief application in pumping from mines, and in recent times for the working of railway signals and points. In England connecting rods are found to transmit the necessary force, without inordinate friction, for distances up to 3000 feet, the rods working horizontally or at any angle of inclination.

The power is generally applied by means of a bell-crank or quadrant at the top of the mine-shaft, the crank being pulled and the vertical pump-rod lifted at each stroke of the connecting rod; the weight of the vertical rods being sufficient (they sometimes weigh more than 50 tons) to insure the downward movement of the pump-bucket or plunger, and therefore the return stroke of the connecting rod. The distance to which it may be profitable or expedient thus to transmit power depends upon many considerations; the

cost of the rods with their supports, the intervening obstacles, such as the inequality of the ground to be traversed, the loss of power by friction, the right-of-way for the rods, and the proportion which these circumstances bear to the comparative expense and convenience of motive power placed nearer to the point where it is to operate. Such considerations have, in England, limited the transmission distance above ground to about 3000 feet, as just stated; but under more favorable circumstances much greater distances may be traversed. The rods are generally of wood, strapped with iron, and are supported on rollers or rocking-posts placed at intervals of about 50 feet. Iron rods are sometimes used where the work is light; but for transmitting considerable power stability against transverse and compressive strains is better obtained by the use of wood; and iron rods are seldom employed except for short distances, while wrought-iron tubes, combining much strength and stiffness with weight, are found most effective for transmitting the force which actuates signals and switches.

For distributing power to numerous machines, shafting is almost invariably employed, but for conveying gross power it is only expedient to use shafting for short distances. The engine or other motor is placed as near the point of distribution as possible, as the cost of the machinery and the friction in working increase rapidly with the distance of transmission. In England it is the general practice to take the power from the main shafts of large fixed engines, by toothed wheels, to one or more secondary shafts, from which the power is distributed by pulleys and belts to the various machines. Where the power has to be conveyed in numerous directions, or to many different workshops, the principal transmissions are either effected by toothed wheels or by belting, the former plan being the most frequent in England. But the use of toothed wheels greatly limits the speed of the shafts, and it is on the principle that quickly-running shafts are the most economical for transmitting a given power, that belting is preferred more often than formerly. Shafting which conveys power in the gross—that is to say, which transmits to one end the entire power it receives at the other—must be of uniform diameter; but the general use of shafting is to distribute power, and in such cases it is made to diminish in diameter with the distance from the motor as the power becomes less by that abstracted. For any but moderate distances it is expedient to place the steam engine or other motor in the middle of the line, and to take the shafts right and left from it, so as to diminish the length of each. In this way shafting is taken as far as 1000 feet in either direction from an engine; but although by careful arrangement and workmanship the friction can be minimized, the loss is considerable, and such long lines of shafting are only expedient when the necessities of distribution along the line are such as to justify a considerable expenditure of power in conveying it. Where there is but one or few machines, a separate motor close to the machine, or transmission by wire rope or water, would generally be preferable.

Belting finds its principal use in the distribution rather than the transmission of power. When, however, it is used for the latter purpose, it does not compare favorably with gearing for slow speeds, and when it is so used it is because of the supposed cheapness or simplicity allowed in the construction of the apparatus, or because of special difficulties in the way of gearing. Belting is not suited for transmitting exact speeds, for there is a liability to slip, which varies according to tension, temperature, tightness of the belt, smoothness of the pulleys and other circumstances. This liability to slip, however, makes it valuable in those cases when a sudden increase of work would endanger the safety of any of the parts of the machinery, breakage being avoided by slipping of the belt. The same relief is obtained in the starting of heavy machinery, the inertia of which is thus gradually overcome. The power which a belt can transmit is measured by its strength (depending on its sectional area and the quality of the leather) multiplied by the velocity. The ultimate breaking strain of leather belts varies, according to their kind, from 3000 to 5000 pounds per square inch of sectional area, but there are wide differences of quality. It is considered expedient to have a considerable margin of strength, and a working strain of from 300 to 350 pounds per square inch of sectional area is usually adopted, from 55 to 60 pounds tension on a belt 1 inch wide and 3-16ths thick being an example. From the gross tension given to the belt has to be deducted, to obtain the net result, a certain proportion which serves only to overcome friction on the pulleys, and though there are variations in friction arising from different causes, one-fourth is generally considered a fair allowance. As an approximate rule, a belt-surface velocity of 55 square feet per minute may be taken as required for each horse-power transmitted; but as belts vary in thickness, such a rule may need qualification. Belts of double or treble thickness afford increased strength in proportion to their greater sectional area. In the United States, where belting is used for transmitting much greater power than is usual in England, main driving belts are made of all widths up to 36 inches, and 3000 to 4000 lineal feet per minute is considered a proper speed, this speed being obtained more by the use of large diameter pulleys than of high-speed shafting. The distance of pulleys does not, unless in exceptional cases, exceed 40 feet for main driving pulleys, or 25 feet between minor distributing pulleys. Belting ropes are sometimes substituted for belting whenever good leather is scarce or flat belts are inconvenient. It is claimed that there is less risk of stoppage, because ropes give earlier warning of deterioration, and, as a number are used to convey large power, the failure of one does not involve immediate stoppage. On the other hand, clutches must be used, instead of fast-and-loose pulleys, for starting the machinery.

A more recent mode of transmitting power is that by wire rope, which possesses the great advantages of strength and endurance, its breaking strain varying from 80,000 to 100,000 pounds per square inch of section. The exact strength and flexibility of a wire rope depend upon the temper of the wire and the manner in which it is twisted; and, as several varieties of wire rope are made, the manufacturer should be informed of the purpose for which the rope is required, the diameter and kind of pulleys, and the tension at which it is to be worked. An iron rope ½ inch diameter will bear from 3 to 4 tons tension, and an iron rope 1 inch diameter 15 to 17 tons before breaking; ropes of similar size made of steel wire being equal to double these strains. About one-sixth of the ultimate tension is considered a fair working strain. The amount of force or energy which a rope will transmit in a given time depends upon its tension multiplied by its velocity, the foot-pound units so ascertained corresponding to a certain horse-power. It is the application of this principle which forms the basis of the teledynamic cable system. Ropes of small diameter are utilized by running them quickly, the desired speed being obtained by making the transmitting pulleys on the motor shafts of large diameter. In practice, the pulleys are of all sizes to 15 feet, and cables of from ⅜-inch to 1-inch diameter, with speeds of from 3000 to 5000 feet per minute (about 30 to 50 miles per hour), transmit any required force up to 400 horse-power. The power is taken by the rope passing round a grooved pulley of large diameter on the motor shaft, and, like a belt, transmitting the force to another pulley at a distance. The shaft to which the force is thus transmitted has a second pulley upon it, from which another rope conveys the power onward to a shaft, and so on by a succession of stages for a mile or more. It has been calculated on the basis of experience already acquired, that 120 horse-power could be transmitted 12 miles with a loss of only 25 per cent. The separate spans vary from 300 to 500 feet, and may be greater. The great advantage of wire rope, which is generally used for transmitting power from turbines or water-wheels, is that power can be conveyed long distances, not only horizontally, but up and down steep grades.

Large Exports of Agricultural Implements.

Taking notice of the various articles making up the bulk of exports from New York from week to week, one cannot fail to observe that agricultural implements are an important item. Mowers and reapers, binders, plows, &c., are in favor the world over, China and the British Possessions in Africa not excepted. But France takes the lead, notwithstanding the heavy duties demanded by that government. Great Britain comes next, not so much to meet the demands of agriculture within her dominions as for distribution to the Continent and elsewhere. Germany, too, buys largely from the United States.

The exports of agricultural implements from New York since the beginning of the present year have been particularly heavy. But of late there are intimations that the markets at several points are being overstocked, some of the adventurers in this line finding that goods are left on their hands. The principal established houses, however, almost invariably sell their goods before they are shipped. It is believed that the export movement to France has been overdone. So, too, of New Zealand and parts of Australia. The trade with Chili has ceased altogether since the commencement of hostilities with Peru.

As will be observed from statistics given below, showing the weekly exports from New York for a month past, England receives agricultural implements on a large scale. But manufacturers remark that she turns out the same class of goods from her own shops. As a consequence, the margin of profit is cut down to the lowest figure, so that while the aggregate of business done is believed to be largely in excess of last year, the net results may not prove as satisfactory. We hear it stated that the English copy American machines as nearly as they can without infringement of patents, from which it follows that the closer they approximate the sharper the rivalry.

South America is spoken of as a good field for enterprise, Monte Video and ports in Brazil promising well. At the same time, it is evident that improved implements are not fully appreciated there. It will not do to merely send out the machines, without suitable men to demonstrate their utility. An exporter says: "If you should send out a treadmill and could get the people on it, it would be sure to go; but the South Americans, as a rule, don't want to labor or to save labor; they don't see the advantage of it."

The following shows the value of exports for a series of weeks:

Week ending.	April 1.	April 8.	April 15.	April 22.
Stettin	$5,224	.....	.....	.....
Hamburg	6,759	8,162	1,481	7,011
Bremen	6,700	11,150	11,864	3,335
Antwerp	510	185	.....	5,656
Rotterdam	6,348	1,707	.....	.....
Bristol	.....	84	280	.....
London	14,039	7,897	6,676	8,398
Liverpool	9,657	16,750	15,795	15,532
Glasgow	.....	80	3,300	.....
Mexico	1,116	.....	.....	996
New Zealand	.....	4,944	.....	.....
Havre	32,589	8,799	33,306	30,742
British Australia	.....	11,816	5,372	.....
Hull	798	.....	5,050	.....
Porto Rico	.....	.....	90	290
Chili	1,855	200	.....	.....
U. S. Colombia	603	447	520	990
Cuba	275	2,216	.....	.....
Brazil	.....	235	476	143
Hayti	122	292	.....	.....
Argentine Rep.	6,591	.....	328	.....

In comparison with last year the export business is larger in volume than these figures would indicate, the valuation having been reduced about one-third.

Usudurian Packing.—The Woonsocket Rubber Company, 80 and 82 Reade street, New York, are meeting with success in the introduction of the Usudurian Steam Packing, an article made of unvulcanized rubber and other substances. It is a non-conductor, and when subjected to the action of steam it is vulcanized and enabled to resist influences which are usually very destructive of ordinary rubber packing. By the application of naphtha to their surfaces, two pieces of the packing may be united, and under pressure become practically one, which is a convenience, as the user is thus enabled to build up any desired thickness of packing.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, May 1, 1879.

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CONTENTS.

The London *Engineer* does not like the idea of an American export trade in locomotives. Commenting on recent Swiss orders for American locomotive engines to burn the Valais coal, that journal says: "English people are wanting work, and yet "for some reason, or want of it, our loco- "motive builders allow a country nearly "2000 miles further away from Switzerland "than we are to supply locomotives to that "country." This is not the first time that English manufacturers have let business slip away from them, under the mistaken notion that those who want must needs come to them. There was a time when such a thing as foreign competition with English locomotive builders was unheard of and unthought of. But things have changed within ten or twenty years, and so far from "allowing" the United States to take business which they are in need of, the English locomotive builders cannot help it. Their permission was not asked, we believe, and the tone of the *Engineer* in commenting on it is very much more like that of a querulous old woman, than like that of a live newspaper commenting on the happenings of the times. Trade which Great Britain cannot hold, no longer belongs to her, and it is rather because of a reason than for want of one, that she is losing some part of the advantage she once had in her trade with other nations.

Foreign Trade Statistics.

The returns of the Bureau of Statistics for March, just received, show a continued increase in imports and a decrease in exports—both of which are indications of improvement in the condition of general trade. The increase of imports shows that the requirements of consumption are becoming more varied, and that a larger demand exists for imported articles of luxury. The diminished exports show that consumption is gaining on production, and that we have a less abundant surplus to spare after our own wants are met. The merchandise imports in March were valued at $41,917,256, against $37,637,871 for March, 1878—showing a gain of about $4,300,000. The exports of merchandise and produce during this period were valued at $66,116,219, against $71,726,578 for March of last year—a decrease of about $5,600,000. As there has been a steady gain in importations since the beginning of the year, it may be assumed that it means a larger consumptive demand for foreign manufactures and products, and the probability is that 1878 will be conspicuous in our national trade statistics as the year of smallest importations and largest trade balance. Coincident with the increase in imports was the decline in exports, and the falling off in three months since the beginning of the year has been at the rate of $60,000,000 per annum. The following is a summary of the March returns:

IMPORTS IN MARCH.

	1879.	1878.
Merchandise	$41,917,256	$37,637,871
Specie	1,184,604	2,187,687
Total	$43,101,860	$39,825,558
Increase	3,276,302	.....

EXPORTS IN MARCH.

	1879.	1878.
Produce & mchdise	$66,116,219	$71,726,578
Specie	2,994,844	2,892,673
Total	$69,111,063	$74,619,251
Decrease	5,508,188	.....

IMPORTS, NINE MONTHS ENDING MARCH 31.

	1878-9.	1877-8.
Merchandise	$329,440,636	$330,113,840
Specie	15,988,126	19,813,243
Total	$345,428,762	$349,927,083
Decrease	4,498,321	.....

EXPORTS, NINE MONTHS ENDING MARCH 31.

	1878 9.	1877-8.
Domestic produce	$549,121,381	$522,657,343
Foreign merchandise	9,450,844	10,571,198
Total goods	$558,572,225	$533,228,541
Specie	15,826,181	23,072,992
Total	$574,398,406	$556,301,533
Increase	18,096,873	.....

COMPARISON OF IMPORTS AND EXPORTS FOR NINE MONTHS.
(*Exclusive of Specie.*)

	1878-9.	1877-8.
Imports	$329,440,636	$330,113,840
Exports	558,572,225	533,228,541
Excess of exports	$229,131,589	$203,114,701

(*Inclusive of Specie.*)

	1878-9.	1877-8.
Imports	$345,428,762	$349,927,083
Exports	574,398,406	556,301,533
Surplus of exports	$228,969,644	$206,374,450

SPECIE MOVEMENT, NINE MONTHS.

	1878-9.	1877-8.
Imports	$15,988,126	$19,813,243
Exports	15,826,181	23,072,992
Excess of imports.	$161,945	.....
Excess of exports.	.....	$3,259,749

From this it will be seen that, notwithstanding the reaction which has set in, the balance in our favor in international trade is still very large. While our credit balance for the three months ended with March is $26,000,000 less than that for the same period of last year, it reaches the very respectable sum of $114,694,000. For the nine months of the fiscal year ended with March, the credit balance in favor of the United States in the merchandise movement is $203,114,701, against $229,131,589 for the corresponding nine months of the preceding fiscal year. When we remember that an enormous excess of exports over imports during the past three years was due to abnormal conditions, and that it was possible only because the general depression caused the most stringent economy of domestic consumption, we have no reason to regret the fact that statistics show a tendency in our merchandise exchanges with other countries to approximate an equalization of imports and exports. We are not in sympathy with those who believe that national prosperity would be best promoted if our exports were enormously increased, and our imports limited to the specie received in payment for what we sent out. The economy and national self-denial which rendered possible the sudden and complete reversal of the course of our foreign trade, may have been a good thing in its resulting efforts, and necessary as a condition precedent to recovery from depression. It was not, however, any more desirable in itself considered than any other form of self-denial. We needed fewer imports, chiefly because our people were poor. We had so great a surplus of food products and useful commodities for export, chiefly because our own people could not retain them for home consumption, and not because we produced in such an enormous excess of our real needs as the statistics of the export movement would seem to show. We have had our years of fasting after our years of feasting, and no doubt we are the better for it; but our increasing ability to consume both domestic and foreign products, is much more an evidence of returning prosperity than would be a continued gain in exports and a further shrinkage in imports. The abundance which is the end and aim of human effort, is not abundance of specie, which cannot be eaten, nor worn nor enjoyed save as a material in the arts, but an abundance of comforts—of food, clothing and other useful commodities which satisfy the needs or gratify the desires of mankind. Were our country drained of such useful commodities by a heavy export movement, and nothing came in save specie or securities, we should soon need more comforts and enjoyments than remained to us, and our coin accumulations, if we could not exchange gold for useful commodities, would quickly become a burden.

Under the operations of a tariff which encourages the development of our varied productive resources, without placing an unwholesome restraint upon the natural course of foreign trade, we can watch the fluctuations of our trade balance without anxiety. Experience has shown that such a tariff as that now in operation does not restrict importations when the requirements of consumption demand them, nor does it impose burdens which consumers find oppressive. The fact that our exports exceed our imports by nearly $300,000,000 per annum, shows that it does not operate to the disadvantage of the consumers of domestic products, since we could not export unless our products were cheap enough to compete with like products of other countries, or with products which, if not like our own, could be substituted for them if enough cheaper to make such substitution an economy. In these respects protection has realized for the American people all the practical benefits ever claimed for it, and it is much to be regretted that each succeeding Congress may be expected to try its 'prentice hand at the work of remodeling it. That it is susceptible of improvement in many respects we do not doubt, but the gentlemen of the Ways and Means Committee are not content with suggesting improvements in the existing tariff. Hence we may expect an annual agitation, disturbing business and unsettling confidence—ending in a burst of popular indignation which causes the politicians to suddenly lose interest in the matter. Knowing, as we do, that these annual attempts to remodel the tariff are prompted by unworthy motives, and have for their object merely the gratification of the personal vanity of certain ambitious "statesmen" who have no other means of attracting public attention to themselves, it is not to be wondered at that business men lose patience and, perhaps, something of their former faith in the benefits of popular government.

Our Imports of Iron and Steel.

Only a few years ago enormous quantities of iron and steel were sold to the United States by foreign manufacturers. The share of the American iron trade enjoyed by our transatlantic competitors was then not only large, but very lucrative, including, as it did, the supply of the most desirable grades of pig iron, the best qualities of bar iron, the finest plates and sheets, and the most expensive steel, to which were added immense quantities of rails, which were made as cheap as possible and sold at the highest rates to American purchasers. Prices were regulated by Glasgow, Liverpool and Sheffield quotations, and American manufacturers were obliged to study the condition of English iron markets, in order to acquire a proper knowledge of the elements governing the American iron trade. The statements of imports and exports, made periodically by the United States Bureau of Statistics, had in those days an importance which can with difficulty be realized now. The American ironmaster was often compelled to gauge his hopes of a living business by the volume of imports, a knowledge of which he could only clearly gain from the statistical reports. His neighbors' rivalry seemed of little consequence when the huge quantities of iron purchased abroad were anxiously contemplated.

This condition of affairs continued with variations only in the line of increasing imports until 1872, when sales of foreign iron and steel manufactures to this country reached their maximum. A sharp decline in imports followed, which was brought about by various causes, and the decline has not yet been arrested, but bids fair to continue until the American iron trade is controlled entirely by American manufacturers. Prices here are no longer regulated by Glasgow, Liverpool and Sheffield; New York, Philadelphia and Pittsburgh fix the ruling rates at which iron and steel are sold in the United States, regardless of the condition of the English or Scotch or Welsh iron trade. The American manufacturers have become numerous and aggressive. So numerous are they that, after overcoming foreign competition in our markets, they are now actively engaged in a bitter contest with one another. They are so absorbed in struggling for a share of the home trade that they devote but little attention to the statistics of foreign sales to this country, save when a phenomenal occurrence like the Vanderbilt steel rail purchase admonishes them that English iron and steel makers still exist.

A retrospect of our imports of iron and steel for a few years may prove interesting at this time, especially as the report of imports and exports for the calendar year 1878 has been issued but a few weeks, and all our readers may not have had an opportunity to compare it with the reports for previous years. Without dwelling upon the causes of the shrinkage in our imports, it is our purpose to show the striking features of this remarkable revulsion in a long-established trade. The following table exhibits a comparison of the total values of our iron and steel imports in the past seven calendar years:

1872	$61,724,227	1876	$10,584,126
1873	45,764,670	1877	9,195,368
1874	24,578,638	1878	8,943,043
1875	15,264,131		

All the above are gold values. The decline in the total value of the iron and steel imports from 1872 to 1878 was $52,781,184, or over 85 per cent. The heaviest drop in any one year occurred in 1874, when the imports were $21,186,032 less than in 1873, which was a decrease of 46 per cent. The decline in 1878 on the imports of 1877 was only $252,325; but even this comparatively small sum is 3 per cent. of the value of the iron and steel imports of the preceding year.

The heaviest decrease among the iron and steel manufactures bought abroad is in the imports of rails, both iron and steel. The following table gives the course of the rail imports from 1872 to 1878, in tons of 2000 pounds:

	Iron rails.	Steel rails.
1872	381,064	149,786
1873	99,201	159,571
1874	7,796	100,486
1875	1,942	16,316
1876	287	None.
1877	None.	35
1878	None.	10

For the past three years American rail makers have not suffered from foreign competition, whatever the future may have in store for them. The percentage of decrease in the importations is a calculation easily performed, reaching 100 per cent. in the case of iron rails, and practically the same for steel rails

The importations of foreign pig iron have not shrunk so much as those of rails. This is simply because the Custom House records do not separate spiegeleisen from ordinary pig iron. Hardly one-fifth of our pig iron imports is ordinary foundry or mill pig iron. The following table, in tons of 2000 pounds, though it includes spiegeleisen, indicates very forcibly that our importations of pig iron have fallen off very considerably:

1872	295,967	1876	83,072
1873	154,708	1877	66,871
1874	61,165	1878	74,484
1875	66,457		

Our purchases of foreign bar iron have diminished in common with those of other kinds of iron, but not to such a great extent, as a considerable quantity is still imported. Some of it is Swedish iron for crucible steel, and some is Norway iron for nail rods, bolts and rivets, but it cannot all be accounted for in this way, and it is quite possible that there may be included with bar iron other rolled iron, which is only classed as bar iron merely because there is no other division in the government reports in which it can be placed. The importations under this head have been as follows, in net tons:

1872	89,576	1876	26,652
1873	62,253	1877	30,478
1874	26,876	1878	33,346
1875	24,591		

From the above figures the importations of Bar iron have apparently increased since 1875, though it is true that in 1878 only 27 per cent. as much bar iron was imported as in 1872. Boiler plate, sheet iron and hoop iron may be grouped together to show the decline that has taken place in their imports, as follows, in net tons:

	Boiler.	Sheet.	Hoop.
1872	684	10,149	12,379
1873	464	10,713	8,245
1874	53	6,736	1,425
1875	46	3,616	228
1876	15	1,758	144
1877	2	1,183	171
1878	1	838	7

It will be seen that the sellers of foreign sheet iron have clung to their declining trade with great tenacity, the above figures for recent years perhaps indicating the precise quantity of Russia sheet iron imported, but the boiler-plate and hoop-iron importers were overpowered soon after 1873 by domestic competition.

A part of the import trade which was once of fair proportions is the scrap-iron trade. Vessels formerly came to the United States from all parts of the civilized world, freighted with all kinds of waste material to be worked over in our foundries and rolling mills. Pig iron was dear, domestic scrap iron was in limited supply, the demand for manufactured iron was brisk, and foreign scrap iron was correspondingly valuable as a convenient raw material. Steel rails were not then being laid in such immense quantities as now, and the stock of old iron rails was very small. The following table shows, in net tons, how the importations of old iron fell when the prices of manufactured iron receded:

1872	278,257	1876	14,149
1873	108,838	1877	10,903
1874	40,746	1878	6,225
1875	25,856		

The imports of cast steel have fallen in quantity and value as our domestic manufacture of steel has grown, but they are still respectably large. The following table will convey an impression of the course of the import trade in cast steel in the past seven years:

1872	$4,106,087	1876	$1,508,851
1873	3,865,316	1877	1,249,844
1874	2,678,611	1878	1,135,764
1875	2,152,303		

We will not extend this inquiry into the miscellaneous manufactures of iron and steel which are included in the total imports given in the first table. The details which have been set forth are sufficient to indicate the general drift of our importations of iron and steel. They show a wonderful and highly gratifying change in the course of the trade, but they also show that something yet remains to be done before the American ironmaster can claim the whole of his own home trade.

Steel from Cleveland Pig Iron.

Our English friends seem to be working themselves into a great state of excitement over the more or less successful attempts to convert Cleveland pig iron into steel at the works of Messrs. Bolckow, Vaughan & Co. It furnishes a fruitful topic for newspaper discussion, which we have followed closely, but thus far we have not had the pleasure of reading any account of the experiments which satisfies us of the practicability of such conversion, when cost and value of product are taken into account. That the conversion has been successfully accomplished, we have no doubt. Steel made from Cleveland pig iron was exhibited recently at Middlesboro', and pronounced equal to metal made from a high grade of Bessemer pig. Concerning the cost, we are told that the saving in the value of material attending the use of Cleveland pig is so great as to leave a wide margin for profit. We hope this is true, as we have a great abundance of ores in this country, not hitherto available in the production of Bessemer iron, which, if everything is as represented, will acquire a new value. But so far as published, the literature of the lime process contains nothing from which we can determine how the basic linings will stand the test of regular work. The first paper on the process was published in *The Iron Age* of October 24th, 1878. This claimed promising results, and subsequent experiments show its efficiency in the elimination of phosphorus so clearly as to leave no room for doubt on that point. But the point of real interest to metallurgists, and one on which we have as yet no information, is how the linings stand. Mr. E. Windsor Richards, manager of Bolckow, Vaughan & Co.'s works, has stated with much satisfaction that Cleveland pig holding 1.5 per cent. phosphorus, has yielded in conversion steel containing only 0.02 per cent.—a result equal to that obtained in converting iron made from the best native or imported ores. But neither he nor any gentleman connected with the works has yet, so far as we know, made any statements as to the durability of the lining. It may be that their limited experience will not yet justify any specific statements on this point, but it is the one of chief importance, and until it is settled the acceptance of this latest improvement in the Bessemer process as an assured success, would be premature. No doubt the eminent metallurgists of the Iron and Steel Institute will thoroughly investigate this part of the subject, and we are quite content to leave the inquiry in their hands. In the meantime we will not be accused of lacking interest in metallurgical progress if we do not throw up our hats and hurrah for steel from pig containing 1.5 phosphorus. We are quite ready to do so at the proper time, but we have seen so many desirable inventions and improvements in iron and steel making succeed experimentally and fail practically, that we incline to wait for further particulars.

Working Steel.

We have several times referred to the unconscious admissions by English trade papers of certain facts or principles which American iron manufacturers have contended for, and which have just as earnestly been denied by English manufacturers. The latest example of this is in the columns of our very able contemporary, the *Ironmonger*, and it relates to steel—a subject which has been as earnestly discussed and on which there has been as wide a diversity of opinion as on any, with the possible exception of the tariff. It is well known that there has been a good deal of complaint about the quality of American steel, more in the past than at present. The American steel manufacturer has argued and asserted that the reason of the complaint was to be found largely in the ignorance, not to say something worse, of the manipulators of the steel. He was answered by the advocate of English steel that this could not be, as users of English steel never experienced such difficulties. It was claimed that English steel was never spoiled in working, and, if American steel was, it must be because it was inferior. But now the *Ironmonger* surrenders this argument entirely. It says in its issue of April 7: "Steel tempering is "an art by no means generally understood, "and there is good reason for supposing "that ignorance on this subject is the source "of frequent annoyance, to say nothing of "it being the cause of a great deal of good "steel being virtually wasted, especially in "the rural districts of this and other "countries." May it not be that the cause of some, at least, of the complaints against American steel are due to the same cause?

In its issue of April 12, the *Ironmonger* again speaks of the many complaints steel manufacturers receive as to the alleged bad quality of their productions. So it seems there are complaints as to English steel as well as American.

The truth regarding steel appears to be about this: There are a few English steel manufacturers who make a very good quality of steel—as good as can be made in the present state of the art. There are a few American manufacturers who make just as good steel as these few English. The very best steel of both can be spoiled by carelessness or ignorance—the American just as easily as the English, and no easier. Then there is other English steel that is just as poor as poor American. When a manufacturer, be he English or American, buys good steel, either English or American, and works it with care and intelligence, he will get good results. If he uses it carelessly, he will get bad results; but when poor steel is bought, whether English or American, the the result will never be satisfactory.

The Marquis of Lorne has taken pains to reassure the home government on the probable effect of the Canadian tariff on the trade of that colony with Great Britain. It is claimed that if the tariff should materially alter the volume of trade, it must be in the direction of an increase, and it is somewhat hastily added that, in several branches, this result will certainly follow. How far this rather indefinite statement will prove satisfactory to our English friends, remains to be seen. Perhaps it may be a consolation to them to learn that the measure is justified on the ground "that the action of the "United States is invariably hostile to "Canada on all matters relating to tariffs, "and that the manufacturers in the United "States can disorganize and destroy any "special Canadian industry by combining "to flood the Canadian market with a simi-"lar product sold below the actual value." It does not seem, however, that all Canadians have reason to be well pleased with what has been done for them. For instance, we learn that the Canadian Southern Railroad paid over $1000 duty on coal consumed on the west end of the line during the first three weeks after the duty of 50 cents per ton was imposed.

New Publications.

THE JOURNAL OF THE IRON AND STEEL INSTITUTE. 1878. No. 2.

We are in receipt of the second part of the volume for 1878 of the transactions of the Iron and Steel Institute, whose proceedings are deservedly those most carefully watched by metallurgists of all countries. The volume before us contains the proceedings of the Paris meeting, the main features of which were presented to the readers of *The Iron Age* immediately after the meeting. They comprise the paper read by Prof. Jordan on the iron resources of France, followed by an interesting discussion, participated in by Messrs. Bell, Riley, Richards, Jordan, Frémy and others, on the effect and economy of various coking ovens for the production of coke for blast-furnace use. Three papers on steel—one by Prof. Akerman, of Sweden, one by Mr. D. Adamson and one by M. Ernest Marché—were read in succession, the discussion taking place on all of them after their reading. The two latter are of lasting value, comparing favorably with anything yet brought forward by the Institute. The discussion turned on the comparative merits of the Bessemer and open-hearth steels, upon the use of mild steel for shipbuilding and boilers, upon the corrosion of iron and steel, and the effect of manganese upon steel. The part containing the papers read at Paris closes with that of Mr. J. Sylvain Perissé on the Ponsard furnace. In the light of recent developments, it would seem that the most valuable and far-reaching communication presented to the Institute was that by Messrs. Thomas & Gilchrist, on their process for diminishing phosphorus, and it will be a source of regret to many that it was not read, and could not, therefore, appear in the transactions. There are a number of appendices, one of which would seem out of place to all but a speech-loving Englishman, who would grieve to be without a full account of after-dinner talks. More interesting are the accounts of the excursions to Terre Noire, St. Chamond, Creusot and Hayange.

Eighty pages of the transactions are devoted to "Notes on the Iron and Steel Industries of the United Kingdom in 1878;" and are a most remarkable jumble of important statistics, notices of minor technical improvements, industrial items which display a want of system, of discrimination, and, we regret to say, a lack of knowledge which is striking. Ostensibly the whole is divided into: I. "Industrial Review." II. "Technological Notes," "Mining Notabilia," "New Inventions and Appliances," "Miscellaneous" and "Obituary." As an instance we will take the "Cleveland District," the first under the "Industrial Review." In this department the general secretary very properly places the production of the Cleveland iron mines and the output of its blast furnaces. Between the latter and a statistical account of the finished iron trade, we suddenly strike a description of Roberts's apparatus to show automatically the hight of the charge in the blast furnace. Then we have a number of short industrial items, giving meetings of prominent establishments, which, perhaps, if they were more numerous, might prove of value. On page 542 we are informed by the "Industrial Review" that a compressed air locomotive for mines is at work at the Pensher Colliery. We turn to "Mining Notabilia" to see what can be possibly left for that department, and find "Determination of Sulphur in Coke." Mr. John Jones, of 10 St. Paul's Road, Middlesborough, we are told, has solved the fearful problem of cleansing and purifying pig. This fortunate gentleman has passed pig through his process and is able to show the following brilliant analysis as the fruit of his labors: Iron, 92.14 per cent.; graphitic carbon, 3.92; combined, none; manganese, 0.76; silicon, 1.73; sulphur, 0.2; phosphorus, 1.43 per cent. We ask in astonishment what has the general secretary been doing during the long and animated debates on the phosphorus question? On the same page, 543, we find him quoting Mr. Bell as follows: "The silica was almost entirely carried off as Si O_2." These examples may suffice, and it will only remain necessary for us to assure our readers that the general secretary or his aide-de-camp has not succeeded in crowding all his errors of judgment and of fact into this one first chapter. We would suggest to the editor of these British "Notes" to study carefully the transactions of other societies, and would beg him to devote to their editing and proof-reading that conscientious labor for which, for instance, the "Transactions of the American Institute of Mining Engineers," edited by Dr. T. M. Drown, or the "Minutes of Proceedings of the Institution of Civil Engineers," edited by Mr. James Forrest, are so remarkable. This would eliminate all errors from the transactions proper. As for such a department as the "Notes," members should continue to rely upon the enterprise and vigilance of technical journals, whose conductors are far better able to follow and judge current progress than a secretary of a scientific body, whose summary, printed slowly and at long intervals, cannot help being far behind the times. In this respect English journalism is well represented, and deserves encouragement and support at the hands of such a body as the Iron and Steel Institute.

BETRIEBSEINRICHTUNGEN AUF AMERIKANISCHEN EISENBAHNEN. Bahnhofsanlagen und Signale (Stations and Signals). By H. Bartels, Berlin.

Although it may be said that the books of the Centennial Exhibition have been closed for some time, the balances (which proved to be very satisfactory ones) have been drawn and the subject dismissed, there come to us from time to time fresh evidences of the good the exhibition has done, not only to us, but to others. The representatives of foreign nations have returned to their homes highly impressed with what they have seen, and eager to urge the acceptance of what seemed to them worthy of adoption or adaptation. This has been notably the case with the German commissioners, whose able reports, notably those of Reuleaux, Wedding and others, have done much to place American industry and enterprise in the proper light. The work before us is the outgrowth of the same purpose of examining critically what is being done in this country, with a view to adopt desirable features of our railroad practice, modified in accordance with the altered conditions. Mr. Bartels treats in this first volume of his report, published at the request and under the auspices of the Ministry of Commerce, Industry and Public Works of Prussia, of stations and signals only. Much of the work is necessarily descriptive, and does not, of course, possess the interest of novelty for American engineers, and yet the book will bear close reading, as every page contains comments and criticism which will all the more command attention, as they are pronounced by one evidently able to appreciate the peculiar conditions under which our railroads were built, and willing to judge our methods from the standpoint thus gained. How great are the difficulties attending an effort to enter into the spirit of our railway and transportation service, will be readily understood by those who have watched Continental methods, often as inexplicable to Americans as our apparently reckless ways are to many Europeans. A flattering tribute is paid by Mr. Bartels to American engineers, who, he says, know how to deal with the most difficult and most important problem, that of adapting themselves to the requirements of every special case with much genius and originality, and often in a grand manner. Mr. Bartels' work has, in printing and illustrations, all the well-known merits of a German government publication, and is remarkably free from typographical errors, which our difficult geographical names make so easily possible.

Demand of Payment.—The Supreme Court of Missouri, in the case of Pier *vs.* Heinrichshoffen, recently decided a rather curious case involving the question of due diligence in making demand for payment. The holder of a note payable in a distant city, sent it by mail for collection to a bank in that city in ample time to reach its destination by ordinary course of mail before maturity. When the letter containing the note reached the city the bank had made an assignment, and the address of the sender being printed on the envelope, the postmaster at once returned it with the endorsement, "bank failed." The holder on the day of its reception again mailed it to another agent, who caused it to be presented and protested for non-payment on the day it was received, but several days after maturity. Held that the holder had used due diligence in making demand of payment, and that he was not required to make provision for a possible but unanticipated suspension of the bank before the arrival of the letter, nor for the unauthorized interference with the same by the public officer in charge of the mails.

Railway Mortality in Great Britain.—The numbers of persons killed and injured in the United Kingdom in the course of public traffic, during the 12 months ending the 31st of December, 1878, as reported to the Board of Trade, were as follows: Passengers—From accidents to trains, rolling stock, permanent way, &c., killed, 24; injured, 1173; by accidents from other causes, 101 and 579. Servants of companies or contractors—From accidents to trains, rolling stock, permanent way, &c., killed, 15; injured, 156; by accidents from other causes, 529 and 1847. Persons passing over railways at level crossings, 48 and 22; trespassers (including suicides), 298 and 147; other persons not coming in above classification, 38 and 83. Total, 1053 and 4007.

The Langloan Iron Company (Messrs. Addie), after fully testing their new blast furnace—the largest one in Scotland—on the close-top principle, have accepted contracts for the erection of another on the same principle and of the same size, which will add very materially to the extent of their daily casting power when it is in full operation.

The Pintsch Lighting System.

In *The Iron Age* of Feb. 13 we printed a communication on Pintsch's Lighting System, in which the most important data in regard to this invention were given. We learn that a company has now been formed, composed of responsible and well-known capitalists, to manufacture gas by the Pintsch process. Mr. Ernst Schoenrock, who has been in this country for some time introducing the process, leaves on Saturday to bring over a complete plant, which it is proposed to set up in Jersey City, N. J. As the extensive use of the process in Germany, England and Russia for a series of years gives it a recognized standing, and as circumstances are in this country even more favorable to its development than in Europe, additional information, for which we are partly indebted to *Engineering*, may prove of general interest.

The manufacture of the gas is not in itself novel, consisting, as it does, chiefly in the distillation of oil or any fatty refuse in a D shaped retort, 10 inches deep. The vapors are conducted through a second retort placed below the first, in which they are subjected to a heat sufficient to decompose them into gases which are permanent even at a considerable pressure. The gas is then passed through condensers in order to deprive it of tarry constituents, and through a washer, two purifiers and a meter. From the latter it is conveyed to a gas holder, where it is temporarily stored. For permanent storage the gas is withdrawn from the gas holder and compressed by a compressor, first to about four and then to about ten atmospheres, in which state the gas is delivered into holders measuring 250 cubic feet, and therefore capable of holding 2500 cubic feet of gas in a compressed state. From these holders the gas is filled into smaller reservoirs (at a somewhat lower pressure), which, being portable, may be taken easily to where the gas is to be burned. For lighting railway cars, for instance, they are permanently attached to the lower part of the car, while for buoys, mines, &c., the mode of use will easily suggest itself. The main feature of Mr. Pintsch's invention is the regulator, by which a uniform pressure is maintained at the burners. It consists of a cast-iron vessel, conical in shape, the upper part of which is closed by a gas-proof membrane. To the center of the latter is fastened a rod with a joint, which is placed in connection with a special valve. The gas passes from the receiver into the regulator, until the tension of the membrane is sufficient to actuate the valve by means of the rod, thus cutting off the supply of gas automatically. The efficiency of the apparatus has been proved by seven years' experience on German railroads, and has been adopted by the Great Eastern Railway and the London Metropolitan road in England. It has so well satisfied the naval authorities in England in regard to its value for lighting channels, that they have ordered buoys of a size capable of supplying a light burning for four to six months. For railway carriages an arrangement is provided by which all the lights can be simultaneously turned down to a faint glimmer and turned up again, which is very useful for trains passing through tunnels. We learn that a 1-foot burner will give a 15-candle power light. As an instance of the permanent character of the gas and its non-liability to condensation, *Engineering* mentions that the receivers of the saloon carriage of the Prince of Wales on the Great Eastern Railway were filled with gas in April last year, and the carriage was used four or five times between that month and August without the receivers being refilled in the interim.

What is the Best Oven for Coking Coal for Furnace Use?

BY JNO. FULTON, E. M.*

From the facts hitherto submitted† it has been definitely settled that certain qualities of coal are the prime elements in the production of good furnace coke. The methods of coking are secondary. If the coal is unfit for making good coke, either from impurities or lack of bituminous matter, no treatment in its coking can correct these normal defects. But, other conditions being equal, the mode of coking exerts a decided influence on the physical structure of the coke, adding to or taking from its calorific value as a furnace fuel. It is remarkable, however, that the most desirable coking coals inherit in their normal composition the elements which give their cokes, under right oven treatment, the best physicial structure for maximum calorific energy and economy in blast furnace use.

That there is a very wide range of differences in the calorific value of coals, in their application to special purposes, has been fully demonstrated. Rich bitumionous coals that would give satisfactory results in generating steam, would be worthless in a blast furnace. Hence, a careful study of each variety of coal has been made, in order that it may be applied in such a manner and to such uses as will insure the greatest efficiency and economy. In this intelligent application of particular varieties of coals to especial purposes, great care has also been taken in the examination of their chemical constituents, physical structure and calorific values. While this triple attention has been given to coals and their right application clearly made out, coke has been regarded simply in two aspects—its hardness and purity.

If it was "dense" with a "silvery luster" and "sonorous," it was received without further scrutiny, and no distinction made between cokes approximating these standard requirements. Coke was coke. And what difference should it make in furnace work if one coke differed in physical structure from another, when both inherited nearly equal volumes of carbon, ash and sulphur? But results obtained from furnace work clearly showed the existence of wide differences in their calorific values—differences so marked as to make questionable the value of certain qualities of coke for furnace work.

* From Report G., Second Geological Survey of Pennsylvania.

† See Report L., Sec. Geo. Survey of Pennsylvania.

Take, for instance, the analyses of the following cokes for blast-furnace use:

TABLE A.

	I.	II.	III.	IV.	V.	Average Stand'd.
Water.....	0.030	....	....	....	0.800	0.85
Vol'le matter.....	0.460	....	....	....	....	0.46
Fixed carbon.....	89.576	87.58	90.48	89.28	91.106	89.06
Sulphur...	0.821	1.06	0.56	1.06	0.544	0.80
Ash.....	9.113	11.36	8.96	9.66	7.550	9.33
Total..	100.000	100.00	100.00	100.00	100.000	100.00

Manifestly there is little difference in the chemical elements of these cokes, from which to infer wide differences in their calorific values in furnace work. Cokes I and IV were made in Beehive ovens—I from coal as it came out of the mine, and IV from washed coal. These are the best qualities of cokes. Coke II is made in Belgian ovens from coal as mined; it also is of the best quality. Coke III is made from washed coal in Belgian ovens. It could not be advantageously used alone in furnaces running on Bessemer pig iron. About 20 to 30 per cent. of it can be used as a mixture with Cokes I, II, IV or V. Increasing its use over these proportions will induce a cooling of the furnace with unsatisfactory work. This has been definitely settled by intelligent tests in blast furnace.

Mr. James J. Fronheiser, superintendent of furnaces, Cambria Iron Company, has recently made some interesting comparative tests of coke in one of the furnaces under his direction at Conemaugh. This rather small furnace was run for a week on Coke I, in Table A, which inherits an open cellular structure. The blast was heated to 800° F., and driven at the rate of 2600 cubic feet per minute. The ores used were mainly from Lake Superior, with some native hematite and Spanish mixtures, producing for the week 156 tons of good Bessemer pig iron. The following week the furnace was run on a fuel mixture of one-quarter Coke I and three-quarters of a coke somewhat denser in structure than Coke I, but in every other respect its equal. The furnace stock otherwise precisely equal during both tests, the blast was increased in volume to 3250 cubic feet per minute to meet the increased density of the fuel. The result was a week's make of 145 tons of good Bessemer pig iron. The consumption of coke in both weeks was 1.29 tons to 1 ton pig metal. The cokes were carefully weighed during both tests. Both cokes were made in Beehive ovens.

The results show that under the best conditions, with the column of blast proportioned to the density of the cokes used, there is a direct loss in a week's work of 11 tons of metal, or 7½ per cent., nearly. The test was made mainly to determine whether the proportioning of blast to the density of each quality of coke would produce equal results. Hence equal weights of coke to 1 ton of pig were used. The question of the relative economy of these cokes, in the quantity of each required to smelt 1 ton pig iron, was not entered into. The test exhibits a loss of product by the languid action of this dense coke, which, considered alone, would reduce its value from that of Coke I at least 11 per cent. It indicates also the loss made by using in mixture in a furnace cokes of different physical properties.

Direct tests were made at the furnaces of the Kemble Coal and Iron Company, in the Broad Top coal region, in December last, by Mr. William Lauder, general superintendent, to determine the relative calorific values of cokes made in Beehive and Gobeit ovens, using the same quality of coal in each kind of oven. The furnace in which the tests were made is 14'x 60', with modern blowing machinery and hot-blast oven. The ores are from the Clinton group, (No. V), well known as the Juniata Fossil Ore, containing 30± per cent. of metallic iron. The coke is made in Beehive ovens. Previous to this test a few Gobiet ovens were erected, from which the coke was obtained for this purpose. The increased density of coke made in this kind of oven was very manifest. It was found that with careful management in both trials it required 2300 pounds of Gobeit coke to carry the same furnace burden as 1900 pounds of Beehive coke. Mr. Lauder writes: "I should like to hear from you on the subject. I confess I am surprised at the results. While this coke was on the furnace it took 5196 pounds to 1 ton of pig iron. With the Beehive coke, 4156 pounds for the same work."

The loss per ton of pig iron made is 1040 pounds of coke, or 20 per cent. If the furnace makes 250 tons a week, the loss would be 115½ tons of coke, at $2.25=$259.87 per week. On the other side two claims are made—one for the economy of labor in the Gobeit oven, the other for a larger percentage of coke from the coal. It will be shown subsequently that an economy of 12 cents. per ton does exist under first claim, and under the second an increase in coke of 14.3 per cent., nearly—taking the product of Beehive at 63 per cent., and the Gobeit oven at 72 per cent.

Taking the weekly make of pig metal, as before, at 250 tons, and using 1.85 tons of coke to 1 ton pig iron, will require 462½ tons a week.

Then 462½ tons, saving 12 cents per ton,....	$55.50
Increase of coke of Gobeit oven, 14.3 per cent.=66 tons, @ $2.25,.....	148.50
Total,...	$204.00

The actual loss per week would be $259.87, less $204, equal $55.87. With the dense coke the furnace worked badly, producing an inferior pig iron.

In this case difference in the densities of the two cokes was much greater than in the cokes used at Conemaugh Furnace trials; hence the increased difference in results. Doubtless the Gobeit oven in the latter case experienced some difficulty in coking a washed coal of rather moderate percentage of bituminous matter, making the ovens run cold and intensifying the dense structure of the coke. But the difference, in practical furnace work, by cokes of varying physical structure is clearly made out. These tests have been corroborated by others pursuing the same general inquiries, but it is presumed that they are sufficient to establish the points raised in the investigation of this Coke fuel question—the direct effect of its physical structure on furnace work.

In pursuing this inquiry it is important to qualify the conditions of its use in furnace work. The advantages of large cellular coke in this respect has been fully illustrated. This result assures the well-known principles in furnace practice, that the more cellular the coke the smaller the volume of blast air necessary to burn it, and that the rapidity of cumbustion is in direct proportion to the amount of surface exposed to the action of the oxygen of the blast air. The best coke for furnace fuel should therefore possess the largest cell structure with the hardest cell walls possible in coke. Many cokes of medium cell structure are compensated by a columnar structure in coking and the consequent breaking up into small pieces. The undesirable cokes are therefore: 1st, Coke of a soft quality and dense physical structure; and 2d, Coke of soft or hard quality made dense by the method of coking.

There may be some exceptions in favor of a moderately hard dense coke in its use as a mixture in anthracite furnaces, as by its density it will bear a pressure of blast nearly equal to anthracite coal and co-operate with the latter in giving out its heat.

A mixture of this kind of coke of one-third to two-thirds of anthracite coal has been found to work advantageously in keeping the furnace open and energyzing the anthracite fuel. This exception in the use of dense hard coke in conjunction with anthracite coal, does not change or modify the general law governing the production of cellular coke for blast furnace use. It only shows that medium dense coke helps anthracite coal in furnace work, and the increased calorific energy which its presence induces would probably be still more marked in anthracite furnaces of moderate hight.

The principle which requires hard cellular coke fuel for blast furnace use, is in requiring a minimum volume of blast in supplying the oxygen demanded in the combustion of the fuel. If the heat at the tuyeres in a blast furnace is taken at 3000° F., and the blast air is forced through the tuyeres at 1000° F., then it is evident that the greater the volume of blast air necessary in the combustion of the fuel (above what is absolutely required for the oxidation of the carbon of the fuel in its best physical condition), the greater will be the cooling effect of this excess of blast air. Hence the prime requirement in producing coke with the largest possible cell structure, so as to afford the greatest surface to the action of the blast air, reducing the latter to its minimum volume. And in this it appears will be found the real difference of coke and anthracite coal in furnace use. Not that there is any marked difference in the heat evolved from their respective carbons; but in the superior calorific energy of the former in its rapidity and economy of combustion produced by its physical structure. The requirements of a good coke, therefore, are: 1st, purity; 2nd, hardness of body; 3d, the largest possible cell structure, limited only by its capacity to sustain the furnace burden.

Two questions follow: What is the best quality of coal for making coke? and what is the best oven for coking for furnace use?

I. What is the best quality of coal for making coke for blast furnace use?

The practical answer to the question is the analyses of coals that are well known to produce the best cokes.

TABLE B.

Analyses of Typical Coals that Make the Best Coke.

	Connellsville Coal. (McCreath.)	Bennington Seam B. (McCreath.)	Lilly's Station Coal E. (McCreath.)	Broad Top, E. K. & L. Co. (Morrell.)	Kelly & Co. (Morrell.)	Ohio—Hocking Valley, Bailey's Run. (Prof. Wormley.)	Average Standard.
Water.	1.260	0.910	0.715	0.82	3.80	1.500	
Voltile mattr	30.107	26.340	22.250	18.86	32.77	26.060	
Fixed carbn	59.616	64.373	70.518	71.12	58.10	64.750	
Sulph.	0.784	1.792	1.459	1.70	1.15	1.380	
Ash...	8.233	6.585	5.058	7.50	4.18	6.310	
Tot..	100.000	100.000	100.000	100.00	100.00	100.00	

This table shows very clearly the essential requisites of coals for making first-class coke.

The relationship of volatile matter to the fixed carbon, as shown in the table, is very suggestive; although the precise agency of the former, in producing large cellular coke, is not yet so clearly made out. The average percentage of fixed carbon in the coals of Table B is 64.75, the volatile matter 26.23 per cent., which can be regarded as constituting an excellent coal for coking. Any excess of volatile matter over 25 per cent. is not a necessity, while on the other side, any large reduction from this volume must be compensated, in supplying heat for coking, at the expense of the fixed carbon, especially in cases where the coal has to be washed. If 25 per cent. of volatile matter is taken as the standard, it will subsequently be shown that 17 per cent. would constitute a minimum in useful or economical coking; but no good furnace coke is known to the writer to have been made from coal from this small ratio of volatile matter.

That hard, dense coke can be made from such coal is a fact fully proved, and that such coke is chemically pure for any kind of furnace is equally well established.

TABLE C.

Analyses Illustrating the Family of Dry Coking Coals, from the Lower Productive Coal Measures of the Allegheny Coal Field.

	Smith & Co. (McCreath)	Bed B.—Unwashed. (McCreath.)	Bed B. Washed. (Morrell.)
Water at 225° F.....	.615	1.185	2.90
Volatile matter.....	17.935	16.540	20.50
Fixed carbon.....	76.503	74.456	73.24
Sulphur.....	.002	1.860	.43
Ash.....	4.345	5.959	3.33
	100.000	100.020	100.00

Coke made from the above peculiar class of coals, while possessing all the essential elements of a first-class fuel, is found in practice undesirable for furnace use, because of very porous or dense physical structure. This has reference alone to the excessively dense cokes—to cokes approaching anthracite coal in closeness of structure, but unmodified by the character of the latter in breaking up in small pieces in furnace work.

With the moderately dense cokes the blast

AMERICAN SCREW CO.,

Providence, R. I.,

MANUFACTURERS OF MORE THAN 4000 VARIETIES OF PRODUCT,

AND INCREASING THE ASSORTMENT DAILY.

Machinery employed contains important inventions recently patented, and which are designed to produce Screws at a **lower cost to the consumer** than has ever been attained.

All goods are distributed through the Hardware trade, to whom a liberal discount will be allowed.

No. 235.)

INTERNATIONAL EXHIBITION.

PHILADELPHIA, 1876.

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons and decreed an award in conformity therewith.

PHILADELPHIA, November 8, 1876.

REPORT ON AWARDS.

Product: **Iron, Brass and Steel Screws, Tire and Stove Bolts, Rivets.**

Name and address of Exhibitor: American Screw Company, Providence, R. I.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for Award, for the following reasons, viz:

Being of a quality nearly approaching perfection, showing the highest attainment in this branch of manufacture.

G. L. REED. Signature of the Judge.

Approval of Group Judges.

Daniel Steinmetz, G. I. Reed, J. Diffenbach
Jas. Bain, J. D. Imbeden, Dav. McHardy
Chas. Staples,

A true copy of the record. FRANCIS A. WALKER, Chief of the Bureau of Awards.
Given by authority of the United States Centennial Commission.

A. T. GOSHORN, Director-General.

[L.S.] J. L. CAMPBELL, Secretary. J. R. HAWLEY, President.

After forty years' experience we offer to the trade our Centennial Screws, patented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the improved article only. To introduce them, they will be sold at the same price as the old style screw.

The new screws will be packed in manila colored boxes with the new label covering end of box, and enlarged figures showing plainly contents.

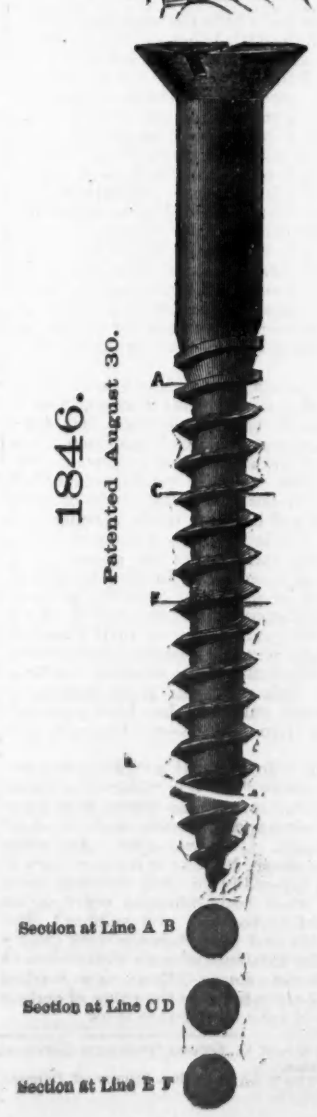
To distinguish this screw we have adopted a trade-mark, which is also secured to us.

The accompanying engravings show the progress of making screw from the old blunt point to style now adopted.

Experience has shown that the weak point of screws, as formerly made, is at the heel of the thread, where all the strains of forcing the screw into the wood naturally concentrate.

To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated. See sections at lines.



CLAIM.

"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

can be proportioned to their density. The main result in the use of coke over standard density will be in the reduction of the make of metal. With very dense coke the result is not only in loss of make of metal, but in its inferior quality and general unsatisfactory working of the furnace from its characteristic soft cell walls.

II. What is the best oven for coking for blast furnace use?

That the mode of coking exerts a very important, though secondary, influence on the physical character, uniformity of quality and dryness of the coke, has been very fully determined in furnace work. But it is questionable whether sufficient attention has thus far been given to the physical structure of the cokes as affected by each class of coke ovens.

The three typical families of coke ovens—the Bakers or Beehive, the Coppée, Belgian or François, and the Appolt—all testify to efforts in the production of coke from widely different qualities of coals, without any design at enlarging or modifying the cell structure, or volatilizing a maximum of sulphur, with an objective aim at the largest percentage of product and economy of work.

The action of each system on the density of the coke will be readily understood if we conceive a brick, laid flat, to illustrate the section of chamber in the Beehive class of ovens, with its necessary shallow charge, minimum pressure in coking, and consequent maximum cellular product of coke.

If a brick is laid on its edge, it will show very accurately the posture and condition of the chamber in the Gobeit, Coppée, Belgian or François ovens, with the necessary pressure induced by the increased depth of charge, producing an increased density in coke.

The Appolt oven is made plain, by setting the brick on end, producing the maximum pressure on its charge, and consequently the densest coke.

Mr. I. L. Bell, however, points out the difference of the physical character of the coke and its influence on furnace operations, in page 315 of his work on "The Chemical Phenomena of Iron Smelting." Reviewing the results of coke in furnace work, made in ovens of ancient and modern plans, he says: "My firm have tried these plans" (Belgian or François ovens), "but found the useful effect in the furnaces inferior to that obtained in the ordinary way (Beehives).

"In consequence of this, all the more recently erected ovens have been constructed upon the old fashion; and I have endeavored to ascertain what are the circumstances which reduce the value of the commodity made according to the more modern improvements below that made in the more simple oven."*

In pursuing this inquiry, he gives the results of several experiments illustrating the action of hot carbonic acid on the carbon of cokes of different physical structure, proving that it is affected in widely different degrees by the solvent power of the carbonic acid gas. In other words, that coke can be made too hard or dense, as well as too soft and open, for the most useful effect in furnace operations, and that a coke of intermediate physical structure between the above is the most desirable in yielding its heat readily, efficiently and uniformly, thus maintaining the train of operations in the chemical reactions of the furnace which are so essential to the best results in its operations.

"Experiment 706. Two and one-quarter grams of hard coke, previously exposed for two hours in a covered crucible to a high temperature, was placed in a combustion tube. All air being expelled from the apparatus, a stream of thoroughly dried carbonic acid was passed over the coke for 15 minutes at a red heat, and for 35 minutes at a bright red (maximum of a Hofman's double furnace). Two liters of carbonic acid were passed over the coke, and from this only 26 c. c. of carbonic oxide were collected, the remainder of the carbonic oxide being unchanged."

"Exp. 708. Hard coke, pulverized to size of mustard seed, exposed at a temperature of melting zinc for three-quarters of an hour to a current of carbonic acid, gave a mere trace of carbonic oxide.

"Exp. 709. Soft coke, similarly treated as previous experiment (708), in 1¼ hours gave 92 c. c. of carbonic oxide, determined by explosion with oxygen and absorption by caustic potash."

These experiments indicate very decidedly the action of carbonic acid gas on the three conditions of cokes submitted to these tests. They exhibit more especially the most desirable condition of coke for furnace use. They do not, however, embrace a wide enough range in the investigation of the physical structure of coke, for "hard coke" and "soft coke" are simply relative terms, indicating the completeness or incompleteness of the operation of coking. Reducing or pulverizing each quality of coke to the size of mustard seed cannot represent related conditions in actual work in the furnace, for the undesirableness of most of the dense cokes consists, in part, of their production in large lumps, while the desirable coke is produced in moderately diminutive pieces.

The prominent and conclusive fact is made out that the make of coke in one class of ovens is not found useful in a degree warranted by the nature of its constituents, and that a different kind of oven, treating the same coal, produced a coke giving entirely satisfactory results in furnace work, under precisely similar conditions with the former.

The extremely soft or partially prepared coke called "black ends," would undoubtedly cause the furnace to work disadvantageously, in loss of heat by its dissolution too high in the stack. This indicates the necessity of the uniformity of quality in the coking of fuel for persistent, useful work in furnace operations.

The examples of the undesirable properties of dense coke in Conemaugh and Kemble furnaces, are sustained by very wide experiences in using too dense a fuel.

Mr. P. Doyle, L. C. E., in the *Colliery Guardian* of February last, indicates an effort recently made in British India to interest the capitalists of Bengal in the development of the native iron manufacture. In this connection, the quality of coke has been entered into: "It is satisfactory to learn that, in order to meet the demand which must naturally ensue, the principal coal companies in this part of India are devoting a great deal of attention to the manufacture of coke. Prominent among the companies is, of course, the East India Railway, whose resources in this respect may be approximated at nearly 50 tons per day. The quality of this coke, although considered the best in India, is not all that could be desired. Its great fault is excessive density, which renders it almost incombustible at ordinary red heat." The analysis yields;

Carbon	84.09
Ash	15.66
Sulphur	.25
Moisture	none
Total	100.00

It is added, "The defect is one that can be easily rectified," and here, just on the threshold of the most interesting inquiry, the correspondent suddenly stops. As the composition of the coal from which the coke was made is not given, it is impossible to estimate whether the objectionable density of the latter can be "rectified" or not. A reduction of its ash is evidently required.

A gentleman from South Russia visited the Cambria Iron Works during the past Centennial year. He was in the pursuit of knowledge. A furnace with which he is connected had been put in blast, with hard Donetz anthracite coal as fuel, composed as follows: Carbon, 95; ash, 3, and volatile matter, 2. This fuel was charged into the furnace in great "chunks" of one-half ton or more. Under the action of heat these did not break up or decrepitate, hence, wide spaces were left open for avenues to blowers, impinging on the furnace lining, and cutting it out in a little over a week's blast. The trial was made a second time, after enveloping the new lining of furnace in a mammoth tuyere. This time the effort was continued over two weeks, terminating in the same disastrous results as in the former case. This gentleman was advised to import an American "coal breaker," or procure a comprehensive assortment of sledges and hammers to break the coal into small pieces before introducing it into the furnace.

Undoubtedly the same experience would have been encountered in the use of the American variety, but for the property the latter possesses of decrepitating freely on exposure to furnace heat, thus exposing enlarged surface space to the action of the reducing gases, and enabling it to be used with a heavy column of blast.

The breaking of larger pieces of all cokes inclined to density of physical structure has been found beneficial in furnace use. In one case a saving of 12 per cent. of fuel was obtained by breaking up the larger pieces. The denser the coke the smaller it should be broken, in preparing it for the blast furnace.

It has been determined that the best cokes for furnace use inherit a physical structure having the cell space to the whole mass in the ratio of 38 to 62, and that the average of the series of best cokes would give as a standard the cell space of 36 to 64 of coke. It is also important that the cell spaces are large and well defined—easily distinguished from diminutive cells or pores. The latter may occupy as large a space in the aggregate as the former, and yet be undesirably dense.

The best quality of Connellsville coal, treated in the Belgian ovens of the Cambria Iron Company, produced a coke of very objectionable density, especially in the bottom and middle of the charge. The effects of the pressure, in the deep charges of this family of ovens, on the density of coke has been observed. It increases from a cell space ratio at bottom of 26 to the standard average of 36 on the section on top.

This is very definitely shown in the coke made in the experimental Gobeit ovens, at the Kemble Furnaces, in the Broad Top Coal Region.

In coking in the primitive pits or mounds, a very full cellular structure is developed—fully equal to the Beehive in this respect. There are, however, two objections to this mode of coking: 1. It produces irregular work, a portion of its coke is soft or "black ends;" and, 2. That it is the most expensive of the systems under review. For uniform, economical work, in coking coal for blast furnace use, it cannot be strongly recommended. Yet, under careful management, in mild, dry weather it has given results, on the whole, fairly satisfactory.

The inquiry as to the best oven will be confined to a comparison of the Beehive and Belgian, the Appolt being regarded as planned for peculiar cases which are not embraced in the limits of the present investigation.

The advantages of the Beehive are mainly as follows: 1. It produces from the coal the best possible physical structure of coke. 2. It yields a uniform quality of coke. 3. Its coke, watered out in the oven, is produced in the driest condition. 4. In rabbling it out it is separated into diminutive pieces; and, 5. The operation of coking in it is simple, and the cost of oven and repairs moderate.

The Belgian or François oven has its advantages: 1st. It produces a uniform quality of coke; and 2d. It is the most economical method of coking.

Its disadvantages consist mainly, with the ordinary coking coals, in making a dense coke. It requires skill in its coking operations. It requires its coke to be quenched outside in a clumsy manner, producing a damp fuel. Its cost is large, but its repairs moderate.

It is only especially adapted to the family of coals demanding pressure in coking, to prevent too inflated a physical structure, and to the peculiar cases hitherto noticed, consisting of coals holding a minimum of volatile matter and requiring washing. It may be urged, however, that the coke from this class of coals, holding a small percentage of the cell-making matter in its composition, is so dense as to be undesirable for metallurgical purposes, and doubtless this is true. But the question arises, whether mixtures of cokes of different densities in a blast furnace are economical, since the blast cannot be proportioned to the densities of the fuel, and must therefore be a compromise with its consequent waste. But in the coking of such coal, a mixture of more bituminous coal might be introduced, enabling it to be coked in Beehive ovens with an improved open structure of coke.

The relative cost of making coke in each kind of oven is hereby given, with original cost of ovens and annual cost of repairs. The estimate contemplates banks of ovens to produce 100 tons of coke per day, or 30,000 tons per year. Coal at $1 per ton delivered at ovens.

Beehive Ovens.

80 ovens at $200	$16,000
Interest on investment 10 per cent. per annum	1,600
Annual repairs and renewals at $10 each	800

Then $\frac{\$2400}{30{,}000 \text{ tons.}}$ = 8 cents per ton of coke.

Cost of Coal and Coking.

1.60 tons of coal at $1 per ton	$1.60
Labor at ovens, charging and drawing	.27
Interest on cost of ovens and annual repairs	.8
Coal, $1.60; coking, &c., 35 cents; total	$1.95

Belgian Ovens.

65 ovens at $700 each	$45,000
Engine for pushing coke out of ovens	3,000
Annual repairs to engine	50
Tracks for engine	300
Annual repairs to ovens	310
Annual interest on investment ($48,800) at 10 per cent., $4,880.	

Then $\frac{\$5{,}240}{30{,}000 \text{ tons.}}$ = 17½ cents nearly.

Cost of Coal and Coking.

Coal, 1.42 tons at $1 per ton	$1.42
Labor at ovens, charging, luting, pushing, &c.	.23½
Interest on cost of ovens and annual repairs	.17½
Coal, $1.42; coking, &c., 41 cents; total	$1.83

The Belgian plant of ovens is the more costly in construction, but less expensive in repairs and coking. The economy in this class of ovens consists in the saving in coal to make 1 ton of coke; the saving in the work of discharging the coke out of ovens and in their annual repairs.

The Beehive oven is less costly in construction but more expensive in annual repairs. Regarding the two systems in the aspect of absolute economy, embracing the interest of invested capital in their construction, with annual repairs of each, and without any reference to the value of the coke made by each kind of oven, the Belgian exhibits an economy of 12 cents per ton of coke in its favor.

But estimating the ultimate results of each quality of coke in blast furnace work, and embracing all the factors demanded in its physical and chemical condition to insure uniform work, maximum calorific energy and economy, the Beehive oven is regarded as possessing the greater number of good properties. That it is susceptible of improvement is self-evident, in the utilization of expelled gases, especially at the commencement of the operation of coking, by introducing flues under the floor of the oven. But in all subsequent changes, the main principles of Beehive coke making should be retained—shallow charges, uniform work, and quenching the coke so as to produce it crisp and dry.

The Belgium or François oven will retain its place of usefulness in coking certain qualities of coals: (*a*) The very pitchy or bituminous coals which agglutinate readily and swell in bubbles of abnormal size. (*b*) The dry burning coals of the Northwest and West, known generally as "block coals." (*c*) And in coking a third class of coals it may be found a necessity—the coals that are low in volatile matter, about 17 per cent. If these are found in a sufficiently pure state to be coked without washing, then the Beehive oven would be the proper method of treatment; but when they require washing, and are charged into the oven in a damp condition, the Belgian oven alone, it is believed, could support the necessary heat by its swift method of discharge of coke, and immediate charge of coal into the hot oven chamber.

In the work of comparing calorific values of the several qualities of cokes by the "Bell Standard," the make of 1 ton of No. 3 pig iron from 40 per cent. Cleveland ironstone, with 2408 pounds (1075 tons) of coke, and blast heat at 932° F., it will be evident that great modifications will be required in the amount of fuel per ton for smelting the several qualities of iron ores, and that this quantity of fuel is not alone determined by the chemical composition of the ores, or their richness in iron, but also by their melecular structures. In the pursuit of this inquiry, an important member is greatly needed—the "coefficient of fusibility" of each quality of the most useful and commonly used iron ores, in the heat units required for the reduction of a fixed quantity of each.

The whole matter of the selection and right preparation of mineral fuel for blast furnace operations, at this time, when the rapidly increasing use of coke is elevating its manufacture among the important national industries, becomes a study of the utmost importance, because of its prime influence not only on the quality and economy of the pig metal, but on the improved qualities of its widely extended products in iron and steel, enhancing their values in home use, and enabling the manufacturer to enlarge his operations by a successful competition in the marts of the world.

Labor and Wages.

The Pittsburgh Iron Mills Relief Society has been gradually gaining until it is now in a flourishing condition, having about 400 members. The dues are five cents per week, and when a member meets with an accident he is entitled to $5 per week.

The majority of the miners in the Connellsville coke regions have resumed work at the old price—25 cents per wagon. Most of the mines and coke ovens in the entire Youghiogheny regions are now at work, as are also most of those located on the different branch roads in Fayette County. The operators are now paying cash to their employees.

The striking glass workers at Pittsburgh have opened a grocery store on the co-operative plan.

The flint-glass houses at Pittsburgh are still in operation, though the strike continues. They are run by "green hands" for the most part. There are rumors that the strikers have concluded to abandon the fight and are making overtures to some of the works for reinstatement.

The Trades Assembly of Allegheny County have resolved that the members shall pledge themselves not to buy coal from dealers or operators who do not pay the miners the price they now demand; also, that the delegates urge their respective unions to take the same pledge.

The drivers and runners at the Henry Colliery, Wilkesbarre, struck on account of a dispute in regard to the number of working hours, throwing 400 miners and laborers out of work. The strikers were discharged, new men were engaged, and operations were resumed.

Duncan, Son & Co., flint glass manufacturers, at Pittsburgh, have made a compromise with their men, and will resume work in about ten days. The compromise was effected by both employers and employees making concessions. The employers will allow the gathering boys to work by the turn, as they did before, and the employees have agreed to allow their employers the privilege of hiring and discharging men at their discretion. The step taken by this firm does not meet with the approbation of the other flint glass manufacturers.

All the puddling furnaces at the Altoona Rolling Mill commenced work on single turn and half on double turn on the 21st. They resume without any concessions whatever from the company, which indicates the entire renunciation of the union by the workmen. Six of the men were not allowed to go to work at the furnaces at all, and a few have stood by the organization and declined to return to the mill.

Scientific and Technical Notes.

Prof. Roscoe, in a lecture before the Royal Institution, refers very favorably to

A NEW CHEMICAL INDUSTRY,

developed within the last few years in France. The molasses from the manufactures of sugar from beet root has been hitherto employed for yielding alcohol. The waste liquors from the stills were then boiled to dryness, and the mass calcined in a reverberatory furnace to recover the alkaline salts. During the calcination the entire amount of organic matter in the waste liquors from the stills was destroyed, until M. Camille Vincent, of Paris, conceived the idea of utilizing them, in which it appears he has admirably succeeded. At the distillery of Messrs. Tilloy, Delaune & Co., at Courrières, the waste liquors are evaporated until they attain a density of 1.31. They are distilled in cast-iron retorts. The residue, after four hours' distillation, consists of porous charcoal and the alkaline salts, while the gaseous products condensed yield ammonia water, tar and combustible gases. The ammonia water contains, besides the constituents of the coal gas ammonia water, large quantities of the salts of trimethylamine. The tar, on redistillation, yields more ammonia water. By concentration the salts of trimethylamine are obtained. Hitherto trimethylamine has been of no commercial value, until Mr. Vincent discovered that by heating the hydrochlorate of trimethylamine, the latter is decomposed into ammonia, free trimethylmine, and chloride of methyl. Ammonia and chloride of methyl possess considerable commercial value, the latter being capable of employment in generating artificial cold, and for preparing methylated dyes, notably a splendid green and a violet.

A startling theory has been advanced by Mr. G. Attwood, in a paper read before the Chemical Society of England, which will make experienced California miners shake their heads. Mr. Attwood asks,

DO GOLD NUGGETS GROW?

and answers by assuming that they do, owing to the accumulation of fresh particles of finely precipitated gold. At Guayana, Venezuela, a large area of alluvial soil has been found to contain gold, and nuggets up to 25 ounces have been discovered within 3 feet of the surface. Quite one-half of these nuggets are covered with a dark-brown substance "resembling a silicate of iron." By treating such a nugget with hydrochloric acid and caustic soda, it was found to be diminished considerably in weight. During this dissolving process much gold in a finely divided state became attached, and after the treatment the nugget was partly covered with a coating of finely divided gold of dull color.

The *Engineer* describes an apparatus invented by E. Wimhurst for

DISTILLING SEA WATER

for a variety of purposes at sea. The arrangement is so made that the waste heat from the boilers is utilized, the generator, a vessel oval in section, being placed in the funnel in a suitable position. It is fitted up with a scraper to remove the salt scale formed, which is taken out through a hand hole. The apparatus does away with the donkey boiler and attendant, and furnishes a ready supply of fresh water.

Mr. Schützenberger, a French scientist who has recently paid much attention to the

ALLOTROPIC FORMS OF METALS,

has now announced that he has succeeded in obtaining antimony, copper, lead and silver in allotropic forms by precipitating the metals from saline solutions by electrolysis and otherwise.

A correspondent of the London *Mining Journal* gives the following details of a new process for

COATING IRON WITH IRIDESCENT COPPER OR NICKEL,

invented by Dr. Weil, of Paris. He has found that the best mode of preparing the metallizing bath and the best proportions of ingredients, are indicated in the following directions: First, 35 parts of crystallized sulphate, or an equivalent amount of any other salt of copper, are precipitated as hydrated oxide by means of caustic soda or some other suitable alkaline base; this oxide of copper is to be added to a solution of 150 parts of Rochelle salt, and dissolved in 1000 parts of water; to this 60 parts of best caustic soda, containing about 70 per cent. soda, is to be added, when a clear solution of copper will be formed. Other alkaline tartrates may be substituted for the Rochelle salt above mentioned, or even tartaric acid may be employed; but in the case of tartaric acid or acid tartrates, a small additional quantity of caustic alkali must be added, sufficient to saturate the tartaric acid or acid tartrate. Oxide of copper may also be employed, precipitated by means of a hypochlorite, but in all cases the proportions between the copper and the tartaric acid should be maintained as above; and it is advantageous not to increase to any notable extent the proportion of the caustic soda. The great advantage of the present process, as compared with that proposed by the same inventor a few years ago, is that he now substitutes a Gramme machine for the alkaline bath before used. The object to be coppered is to be cleaned with a scratch brush in an alkalino-organic bath, and attached to the cathode, and immersed in the coppering bath and treated with the usual precautions, when it will become rapidly coated with an adherent film of metallic copper. As the bath gradually loses its copper, oxide of copper as above prepared should be added to maintain it in a condition of activity; but the quantity of copper introduced should never exceed that above prescribed, as compared with the quantity of tartaric acid the bath may contain. If the quantity of copper notably exceeds this proportion, certain metallic irisations are produced on the surface of the object. These effects may be employed for ornamental and artistic purposes. According to the time of the immersion, the strength of the current, and the proportion of copper to the tartaric acid, these iridescences may be produced of different shades and tints, which may be varied or intermingled by shielding certain parts of the object by an impermeable coating of paraffine or varnish, while the iridescent effect is being produced on the parts left exposed. All colors, from that of brass to bronze, scarlet, blue and green, may be thus produced at will. If it be desired to deposit nickel, the only modification of the above process requisite is the substitution of precipitated oxide of nickel for the oxide of copper, produced by precipitation as above mentioned.

Before the recent meeting of the Institution of Naval Architects, Mr. S. J. Humphreys read a paper on

A METHOD OF MECHANICAL SHIPBUILDING.

He proposes that the process of building shall be carried out as follows: A permanent building shop, consisting of strong and rigid frames, erected at regular intervals in the direction of its length, and braced together longitudinally, covered by a suitable roof, is to be built on a firm foundation, the whole forming a perfectly rigid framework, capable of sustaining the weight of the ship. In these frames he would fix suitable packings, made up to the exact transverse sections of the ship at the various stations, and on these packings he would inscribe offsets representing the points where the connecting flanges would meet each other; the particulars could be readily obtained by projection on the mold floor. A skeleton mold or cradle representing the form and lines of the vessel would thus be formed, in which the ship could be built without risk of subsidence or loss of form. A system of cranes could be conveniently arranged above, from which the mechanical riveters could be carried (and, if on the hydraulic principle, they could be in communication with a hydraulic main and accumulator for working them). He proposes that there should be a number of the channel sections varying in size and thickness, and which might be described as No. 1, No. 2, No 3, &c. A code of rules could be framed similar to Lloyd's tables, from which could be ascertained the weights of the various sections required in the construction of any given size of vessel, such size to be based, say, on the under-deck tonnage, &c. The cost of labor would be very greatly reduced, as the furnacing and setting of frames, reverse frames and floors would be dispensed with, and a great saving would be obtained in a large portion of platers' work, particularly punching, templating and setting; and of shipwrights' work in shoring, staging and ribbanding, all risks of subsidence and loss of form (necessitating at present constant care and attention) being obviated by building in the rigid cradle; and sound and cheap mechanical riveting would be substituted for expensive hand-riveting, which is not always so faithfully done as it should be. There would be also a decided advantage to the manufacturer of the material by its being confined to a certain number of recognized sections, which could be rolled much as rails are. All these considerations would result in a great rapidity of construction, which in a large vessel might amount to two or three months' less time than at present required.

The *Engineer* describes a

NEW PROCESS FOR COPYING DRAWINGS

when only a few copies are needed, say 20 or 25. It has lately been brought out in Paris, and is said to be very useful. The apparatus consists of a shallow zinc tray, in which is contained a smooth, jelly-like, cream-colored substance, resembling in some degree partially solidified flour paste. The drawing to be copied is made with a special ink. As soon as it is dry it is turned face downward on the contents of the tray. The back of the drawing is then rubbed over with the hand. The sheet is then lifted up, leaving much of the ink transferred to the substance in the tray. A sheet of clean paper now takes the place of the drawing, and by rubbing it over gently with the hand an accurate copy of the original is obtained. With care, as many as 100 copies can be had. When all that are needed have been taken, the composition in the tray is washed with a damp sponge, and is then ready for use again. The nature of the composition has not been made public.

In the United States Circuit Court at Boston, Judge Lowell has rendered a decision denying the motion to attach in the case of the Union Metallic Cartridge Company against the United States Cartridge Company. The Court does not feel at liberty to decide a question of infringement.

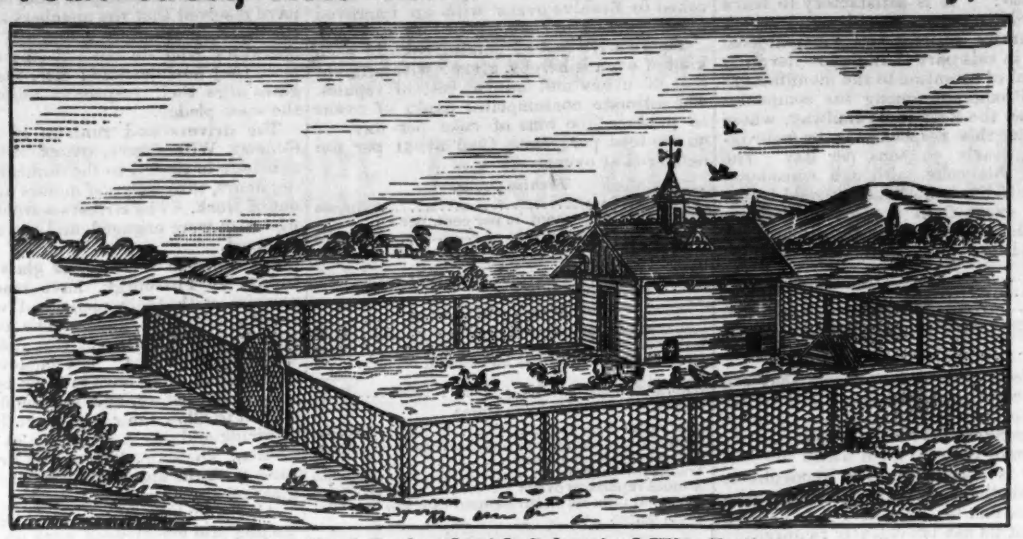
* Hon. D. J. Morrell, who has just returned from Europe (Oct. 1878) visited, when in England, the extensive iron works of Mr. I. L. Bell's firm. He found the coke being prepared in extensive and complete Beehive ovens. The charge to each oven was six tons of coal, yielding 3⅝ tons of excellent coke (58.2 per cent.)

The practice and authority of the author of "Chemical Phenomena of Iron Smelting" are on the side of Beehive ovens.

THE GILBERT & BENNETT MANUFACTURING CO.,

Warehouse, 273 Pearl Street, New York. **Factory, Georgetown, Conn.**

These Nettings are valuable in the construction of Henneries, Pigeon Houses, Rabbit Hutches, Aviaries Poultry Hurdles, &c., &c., and of use in covering Glass, protecting Plants, training Vines, and very many places where heavier and more costly Nettings are not required.

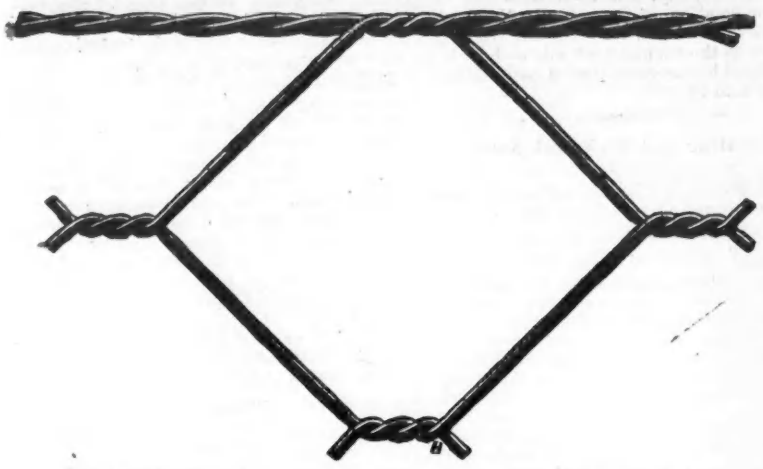


Poultry Yard Enclosed with Galvanized Wire Netting.

These Nettings are Galvanized in the piece, making them very firm and strong, and protecting them from the action of the weather.

The manufacturers have had these Nettings in use for 12 years, and they are at present in a perfect state of preservation, and to all appearances will last 100 years.

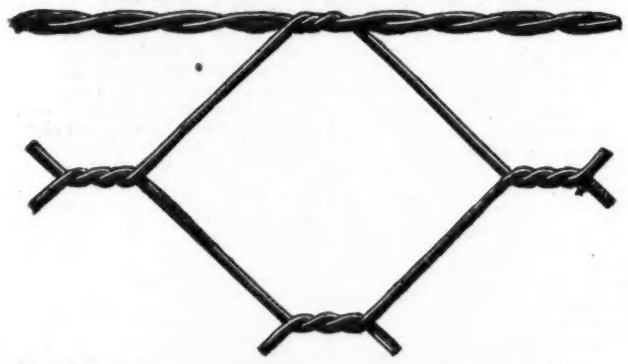
2 Inch Mesh Ordinary Poultry Netting.



No. 18 Wire	3	cents	per square foot.
No. 19 "	2½	"	"
No. 20 "	2⅜	"	"

Widths in stock, 12, 18, 24, 30, 36, 42, 48, 60 and 72 inches.

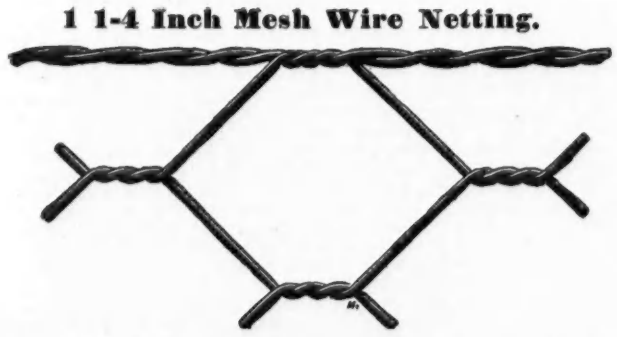
1 1-2 Inch Mesh Wire Game Netting.



No. 18 Wire	4¼	cents	per square foot.
No. 19 "	3½	"	"
No. 20 "	3½	"	"

Widths in stocks, 24, 30, 36, 42 and 48 inches,

1 1-4 Inch Mesh Wire Netting.



No. 18 Wire	6½	cents	per square foot.
No. 19 "	5½	"	"
No. 20 "	5¼	"	"

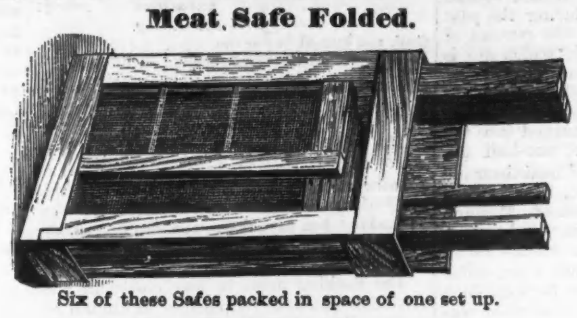
Widths in stock, 24, 30, 36, 42 and 48 inches.

1 Inch Mesh Wire Glue Netting.

No. 18 Wire	8¼	cents	per square foot.
No. 19 "	6½	"	"
No. 20 "	6	"	"

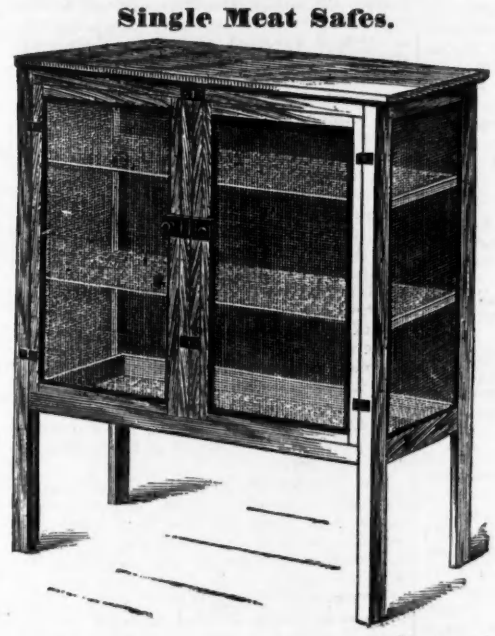
Widths in stock, 24, 30, 36 and 48 inches.

Meat Safe Folded.



Six of these Safes packed in space of one set up.

Single Meat Safes.

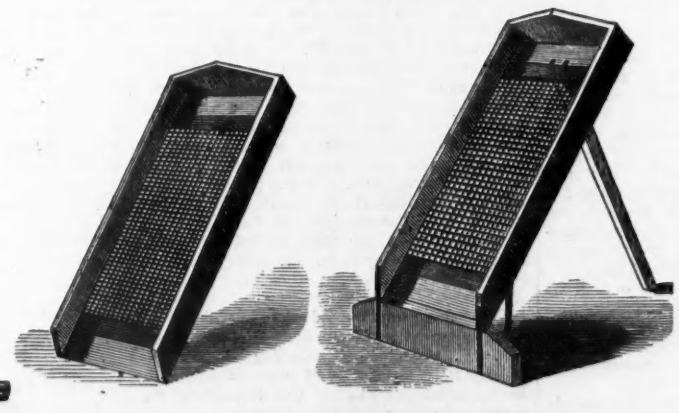


No.	Length.	Width.	Hight.	Hardwood Frames.
1	30 inches.	16 inches.	46 inches.	$5.00 each.
2	36 "	18 "	48 "	6.00 "
3	42 "	18 "	50 "	7.50 "

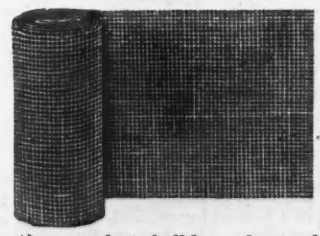
Double Meat Safes.

No.	Length.	Width.	Hight.	Hardwood Frames.
1	30 inches.	16 inches.	46 inches.	$9.00 each.
2	36 "	18 "	48 "	10.00 "
3	42 "	18 "	50 "	11.50 "

Coal Screens.



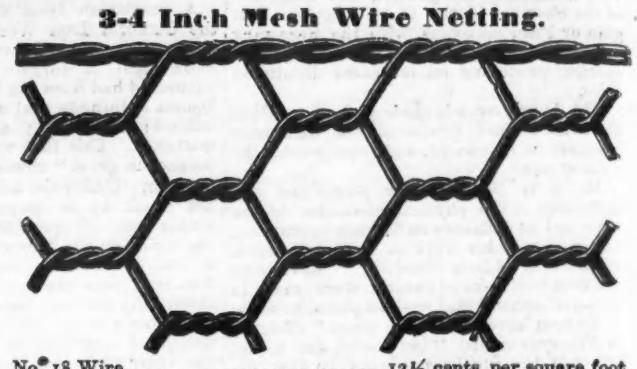
Power Loom Painted Screen Wire Cloth.



No length less than 100 feet shall be understood to be a Roll.

Plain Green or Drab by the roll	4	cents	per square foot.
Figured " "	6	"	"
Landscape " "	14	"	"

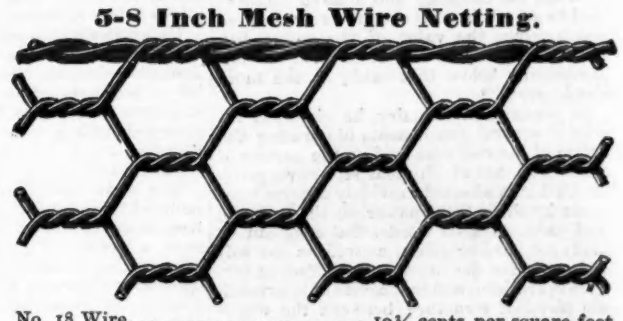
3-4 Inch Mesh Wire Netting.



No. 18 Wire	12½	cents	per square foot.
No. 19 "	10¾	"	"
No. 20 "	9	"	"

Widths in stock, 24, 30, 36 and 48 inches.

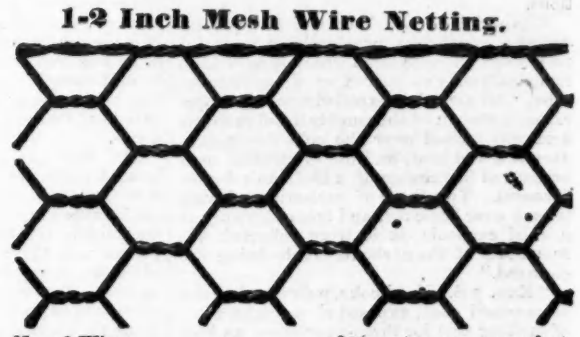
5-8 Inch Mesh Wire Netting.



No. 18 Wire	19¼	cents	per square foot.
No. 19 "	18	"	"
No. 20 "	16¼	"	"
No. 22 "	14½	"	"

Widths in stock, 24, 30 and 36 inches.

1-2 Inch Mesh Wire Netting.



No. 18 Wire	28¾	cents	per square foot.
No. 19 "	25¼	"	"
No. 20 "	21½	"	"
No. 22 "	19¾	"	"

Widths in stock, 24, 30 and 36 inches.

Galvanized Wire Cloth.

In calling the attention of the reader to our Galvanized Wire Cloth, would say that we galvanize these goods after being woven, by which means the fabric is forever protected from rust, and a degree of strength imparted to the goods that could be obtained in no other way, the intersection or crossing of each wire being completely soldered together, forming a perfect sheet of perforations, with no possibility of the wires slipping together.

For use in Water Works, Strainers for Drains, and for forming separations in Fish Ponds, this article is now superseding the use of Copper Wire Cloth and Perforated Copper and Zinc, the cost of the Galvanized Wire Cloth being two-thirds less than copper, and its durability as great as the latter, and where used it is giving general satisfaction. It is also extensively used to protect church, factory, school houses, cellar and stable windows, wool dryers, and for drying fruit it is coming into very general use.

				Cts. per sq. foot.
No. 2 Mesh Galv. Wire Cloth	made	from	No. 16 wire	14
No. 2 "	"	"	No. 17 "	12
No. 2 "	"	"	No. 18 "	10
No 3 "	"	"	No. 18 "	14
No. 3 "	"	"	No. 19 "	12
No. 3 "	"	"	No. 20 "	10
No. 4 "	"	"	No. 20 "	14
No. 4 "	"	"	No. 21 "	12
No. 4 "	"	"	No. 22 "	10
No. 5 "	"	"	No. 21 "	14
No. 5 "	"	"	No. 22 "	12
No. 5 "	"	"	No. 23 "	10
No. 5 "	"	"	No. 24 "	9
No. 6 "	"	"	No. 22 "	14
No. 6 "	"	"	No. 23 "	12
No. 6 "	"	"	No. 24 "	10
No. 6 "	"	"	No. 25 "	9
No. 8 "	"	"	No. 24 "	14
No. 8 "	"	"	No. 25 "	12
No. 8 "	"	"	No. 26 "	10
No. 8 "	"	"	No. 27 "	9
No. 10 "	"	"	No. 26 "	14
No. 10 "	"	"	No. 27 "	12
No. 10 "	"	"	No. 28 "	10
No. 10 "	"	"	No. 29 "	9
No. 12 "	"	"	No. 27 "	14
No. 12 "	"	"	No. 28 "	12
No. 12 "	"	"	No. 29 "	10
No. 12 "	"	"	No. 30 "	9

Discount.

Discount on 1 Bale, 45 ⅌ Cash. Discount on 10 Bales, 50 ⅌ Cash. Discount on 50 Bales, 55 ⅌ Cash.
Cut Bales, List Price, Net Cash.

We can make any width desired, from 6 to 84 inches wide.

6 and 9 inches used for Croquet Grounds and Borders.

FOR SALE.—Water power, situated at the depot, Georgetown, Conn., on the Danbury and Norwalk Railroad, 70-horse power, together with 12 dwelling houses, 15 acres of land, occupied now as a wire mill. Also one other Wire Mill, occupied now as a Fine Wire Mill. Also another Mill, occupied as a Grist Mill, with 30 acres of land. All of the above will be sold low. Price made known on application at the warehouse, 273 Pearl st.

For Further Information send for New Illustrated Catalogue.

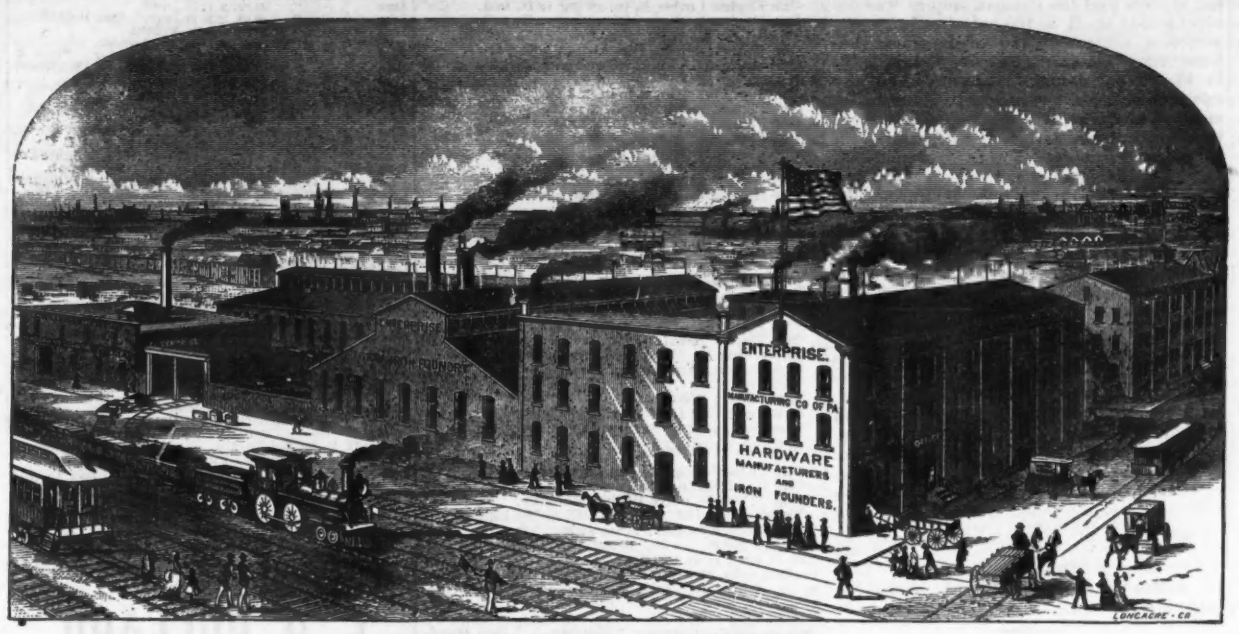
ENTERPRISE MANUFACTURING COMPANY of Pa.,

Patented Hardware Manufacturers and Iron Founders,

Third and Dauphin Streets, Philadelphia. New York Branch House with HORACE DURRIE & CO., 97 Chambers Street, New York.

Showing Mill Closed.

Twenty Sizes.



VIEW OF WORKS.

Shewing Mill Open.

From $2 to $100.

Combined Sausage Stuffer, Fruit, Lard and Jelly Press.

EIGHT STYLES, From $2 to $9.

Mrs. Potts'

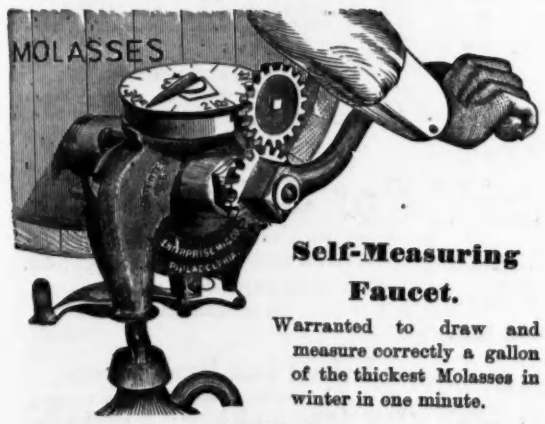
Showing a Set of No. 50 or 55 Irons.

Double-Pointed Smoothing, Polishing and Girls' Toy Irons.

THE BEST IN THE MARKET.

Champion Dried Beef Shaver, Potato, Fruit and Vegetable Slicer.

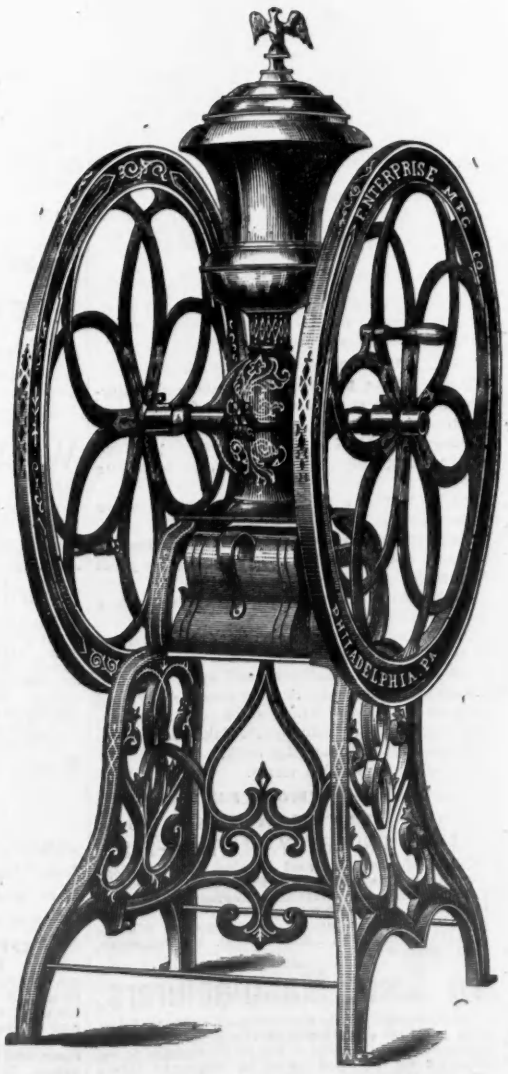
PRICE, $6.



Self-Measuring Faucet.

Warranted to draw and measure correctly a gallon of the thickest Molasses in winter in one minute.

PRICE, $3.



No. 20 Mill.

Unique Butter Knife and Extractor.

For extracting Butter, &c., from the tub or package in a neat and clean condition.

PRICE, $1.25.

Enterprise Self-Weighing Cheese Knife and Safe.

WEIGHS CORRECTLY AND IS LABOR SAVING.

Without Cover..... .....$10.00
With Cover..... ..... 13.00

Enterprise Tincture Press.

SUPERIOR TO ANY IN THE MARKET.

FOUR SIZES, From $3 to $10.

Enterprise Bung-Hole Borer or Hollow Auger.

THREE SIZES, From $1.50 to $3.

Champion Tobacco, Root and Herb Cutter.

No. 1, $2; No. 2, $3.

FOR SALE BY THE HARDWARE TRADE.

A Comparison of European and American Railroads.

In the report of Mr. W. A. Anderson, Assistant Commissioner from the United States to the Paris Exhibition, on the subject of transportation, we find the following:

As there is no part of the world where railroads have been such an important agency in material development as has been the case in the United States, so it is gratifying to observe that nowhere else has there been greater progress in the art of railway construction, or in the business of railway administration and management. Of the 185,000 miles of completed railways in the world in 1878, nearly one-half were in the United States. Having reference to territorial areas, this preponderance is very great, but as compared with populations, it is enormous. With vast regions urgently demanding the speedy construction of new roads as the line of civilization has moved across the continent; with the needs of the older settled portions of the country not by any means supplied, and with that impatience of delay and eagerness of enterprise which are characteristic of the American people, it is not surprising that there should be much that is crude and superficial in many of the railway works of this country. But when we consider the relative cost of construction, the wants of a comparatively new and partially developed country, and the nature of the means available for railway construction, it will be found that American railroads, in the condition of their permanent ways and of their rolling stock, in their system of administration and in their efficiency, will compare favorably with those of any other country. In many regards they would not be as well suited to the countries and populations of Europe as the practice of railroad construction and management now universally prevailing in those countries. Indeed, the characteristics, social relations, and the wants of the people and needs of the country, are so different from those of European nations, that it is difficult fairly to contrast the European railway systems with the American. Particulars in which theirs would not be at all adapted to this country, render them all the better suited to the needs of the transatlantic populations. There are some things in the European railway practice which strikes an American as inferior in convenience to the practice adopted in the United States, particularly their arrangements for the movement of passengers and their baggage. There is frequently a want of co-operation between railway companies in the arrangements of through tickets over connecting lines owned by distinct companies, and the simple and convenient system of through checking of baggage prevailing in this country is almost wholly unknown. There are other striking particulars in which the practice of European railways, their management of trains, their plans and arrangement of cars and coaches, differ from the American railway system; but these are often not only different, but almost equally good, modes for reaching the same results which are obtained in America by other and not superior methods.

Their sub-division of their passenger coaches into coupés or sectional compartments, each seating six, eight or ten persons, when full, and having no means or direct communication with each other, or with the other cars of the train; their provision of retiring rooms at their stations, instead of having any such conveniences upon ordinary passenger and express trains, which appear at first awkward and inconvenient to the persons accustomed to the American system, are not without their advantages. Their system of guards upon passenger trains who do not control the movement of the train, their position being quite inferior to that of the American railway conductor; of managing their trains by telegraphic signals from the principal stations, as is the case upon some lines; of always requiring a passenger to have a ticket before allowing him to go upon the train, and of never allowing a fare to be paid upon the train, possesses some advantages over ours. When we consider the character of the respective populations, the effects of class distinctions everywhere so marked and so recognized in the Old World, the diversity of European populations and the comparative shortness of journeys, many of the objections that at first suggest themselves to the arrangements adopted upon European railways disappear. There is certainly much to admire in the wonderful system and exactness with which hundreds of trains are daily moved upon the network of railroads in the vicinity of their chief cities. In these vast centers of dense population and enormous traffic, the movement of trains and the transportation of passengers and freight are conducted without collision or confusion, with the regularity and precision of clockwork. In the convenient arrangement and substantial construction of depots and depot buildings, the Continental and British railways are equally abreast of the very best practice of the strongest and best-managed railroads of this country. In the regard shown for human life, the provision made at stations for crossing the tracks by bridges above or arched ways below the roadway, in the facilities provided for imparting reliable information to travelers as to routes and trains, and the courtesy of the railway guards and officials, some of the European lines set the example which would be well for all railroad companies to imitate.

The report then gives an interesting synoptical view of the railway systems of the leading European nations. The French system dates its growth from 1840. The roads *ancien réseau* (old net work), were constructed largely by private enterprise, and constituted the trunk lines. The *nouveau réseau* (new net work), or tributary lines, were aided by a government guarantee of 4 per cent interest, with 65-100ths per cent. additional per annum as a sinking fund. In 1878 there were 15,000 miles of completed railway in France. The gross receipts were $162,847,105. The average receipts per mile were $13,132. They employ 183,000 persons, or an average of 12 6-10ths per mile. The mean velocity of passenger trains an hour is 32 miles. In Great Britain there were 17,000 miles of road open in 1877, at an average cost complete of $174,000 per mile. The net earnings for 18 years have exceeded 4 26-100 per centum per annum upon the whole amount of capital invested. Mr. Anderson observes that this gives some idea of the prudence, economy, skill and faithfulness of the management of English roads.

The right of way has also been a much larger element of first cost than in any other country. The rate of speed on English railways is greater than on any other railroads in the world, averaging for passenger trains 40 miles an hour, with a maximum of 70 an hour on best trains. The report states that the weight of locomotives is being largely increased, attaining a maximum power at a minimum consumption of fuel. Mr. Anderson regrets that the German empire was not represented at all, as the art of railway construction, equipment and management has been brought to a higher degree of excellence in that great country than anywhere else upon the Continent of Europe. The problem of broad and narrow gauge roads, as applied to general traffic and city transportation, is as much a subject of controversy among European as among American engineers. The gauge of the trunk lines of Europe is 4 feet 8½ inches between the rails. The narrow gauge, as generally adopted in Europe, is 39 371-1000 inches. The cost of these roads is $29,000 a mile. In England narrow-gauge roads have been reduced to 2 feet 11½ inches.

Bessemer Steel Inkstands.—With the view of showing how Bessemer steel can be adapted to various purposes, Messrs. Brown, Bayley & Dixon, of the Sheffield Steel and Iron Works, have, by way of curiosity, turned out a number of inkstands manufactured from rail ends. Each of these inkstands is made from a piece of the firm's ordinary Bessemer steel rails, and is without any weld, the holder for the ink bottles, &c., being drawn out of the head, and the pen-rack forged from the flange. The inkstands are not intended for sale, not being sufficiently ornamental for that purpose.

From the Maryland region the coal trade has opened up quite brisk. For the week ending April 12th 33,103 tons of coal was shipped, against 30,060 for the same week last year. Total for the year, 303,870, against 242,627 last year—an increase of 61,243 tons.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, April 30, 1879.

The past week has been uneventful in financial circles. There has been an active but not unexpected demand for 4 per cents, at 101¾ @ 101⅞, at which prices the syndicate have disposed of about $40,000,000 to permanent investors. The money market is easy, with call loans at 3¼ @ 3½ %. On United States bonds as collateral, money can be borrowed in any quantity at 1½ @ 2½ %. The discount rate on prime business paper is 4 @ 5 %.

Government bonds are active and strong. Railway mortgages are dull and the investment demand is very light. We give below the closing quotations of active shares.

In the stock exchange there has been an active speculation, chiefly in Southwestern stocks, with a sharp rise in Kansas Pacific, Wabash, Kansas City and Northern, and kindred stocks. Other stocks were less active, but the entire list was strong. We give below the closing quotations of active shares.

The bank return shows an increase of $2,840,100 in surplus reserve, which now stands at $12,324,050, against $17,300,150 at this time last year, and $13,674,200 at the corresponding period in 1877. The loans show a decrease this week of $54,400; the specie is decreased $647,500; the legal tenders are augmented $4,552,400; the deposits other than United States are up $4,259,200, and the circulation is decreased $13,600.

The following is an analysis of the bank totals of this week compared with that of last week:

	April 19.	April 26.	Comparisons.
Loans	$231,151,300	$281,096,908	Dec... $54,400
Specie	18,875,600	18,228,100	Dec.... 647,500
Legal t'nd'rs	40,072,100	45,224,500	Inc....4,552,400
Tot. reserve.	59,547,700	63,452,600	Inc...3,904,900
Deposits	200,255,000	204,514,200	Inc...4,259,200
Reserve required	50,063,750	51,128,550	Inc...1,064,800
Surplus	9,483,950	12,324,050	Inc....2,840,100
Circulation.	19,721,200	19,707,600	Dec.. 13,600

The foreign trade movements at the port of New York since our last issue are shown in the following tables:

IMPORTS.

For the week ended April 26:

	1877.	1878.	1879.
Dry goods	$1,111,845	$1,148,496	$1,785,385
General mdse..	6,132,249	5,183,353	5,687,716
Total for week.	$7,244,064	$6,331,849	$7,473,101
Prev. reported..	103,028,044	90,653,114	95,365,350
Since Jan. 1	$110,272,108	$96,984,963	$102,838,451

Included in the imports were articles of merchandise valued as follows:

	Quantity.	Value
Anvils	180	$599
Brass goods	23	2,077
Bronzes	12	3,57[illegible]
Chains and anchors	41	2,368
Copper		1,108
Cutlery	76	22,637
Guns	48	8,848
Hardware	2	127
Iron, pig, tons	200	2,459
Iron, sheet, tons	11	1,006
Iron ore, tons	1,676	4,604
Iron, other, tons	1,385	47,289
Lead, pigs	300	1,994
Metal goods	126	16,267
Needles	15	6,438
Old metal		172
Platina	2	5,020
Percussion caps	1	125
Saddlery	5	967
Steel	1,916	9,133
Silverware	5	114
Tin, bxs	29,556	142,307
Tin, 3,813 slabs	405,332	60,375
Wire	101	4,588
Zinc	36,382	1,670

EXPORTS, EXCLUSIVE OF SPECIE.

For week ended April 29:

	1877.	1878.	1879.
For the week	$4,591,867	$5,945,499	$6,956,903
Prev. reported..	81,774,238	107,557,456	96,480,289
Since Jan. 1	$86,366,005	$113,502,955	$103,437,192

EXPORTS OF SPECIE.

For the week ended April 26:

Total for the week	$223,875
Previously reported	6,389,648
Total since January 1, 1879	$6,613,523

Government bonds close strong as follows:

	Bid.	Asked.
U. S. Currency 6's	124¼	125
U. S. 6's 1881 registered	106⅛	106⅛
U. S. 6's 1881 coupon	106⅛	106⅛
U. S. 5's 1881 registered	103⅛	103⅛
U S. 5's 1881 coupon	104⅛	104¼
U. S. 4½'s 1891 registered	106⅛	106¼
U. S. 4½'s 1891 coupon	106⅛	106⅛
U. S. 4's 1907 registered	101¾	101⅞
U. S. 4's 1907 coupon	101¾	101⅞

The following were the closing quotations of active shares:

	Bid.	Asked
Albany and Susquehanna	89	90
American District Telegraph	58	59
Atlantic and Pacific Telegraph	32¾	33
Burlington and Quincy	113	114
Canada Southern	59	60
Canton	30	32
Col., Chicago and Indiana Central	7⅝	7¾
Clev., Col., Cin. and Indianapolis	44	44¾
Cleveland and Pittsburgh	97	97½
Chicago and Alton	76½	77½
" " " Pref	106	...
Delaware, Lack. and Western	51⅝	51¾
Delaware and Hudson Canal	45¾	46
Express—Adams	108	109
" American	49	49½
" United States	48½	49
" Wells, Fargo & Co	100	100¼
Erie	26½	26¾
" Pref		48
Fort Wayne	107½	....
Harlem	158	160
Hannibal and St. Joseph	18	....
" " " Pref	40¾	....
Illinois Central	85½	86
Kansas Pacific	58½	59½
Kansas and Texas	13⅞	14
Lake Shore	72	72¼
Louisville and Nashville	56⅜	56¾
Michigan Central	79	79⅛
Morris and Essex	86½	87
New Jersey Central	43¼	43⅜
" Southern	2½	2¾
Northwest	58½	58¾
" Pref	89¾	89½
Ohio and Mississippi	14¾	14⅜
Pacific Mail	13⅜	13¾
Panama	136	140
Quicksilver	14½	15¼
" Preferred	37	38
Rock Island and Pacific	130¼	131
St. Louis and Iron Mountain	20	20¼
St. Louis Kansas City Northern	15¼	15⅜
" " " Pref	42¾	42¾
St. Louis and San Francisco	9¼	9⅜
" " Pref	10⅝	11
St. Paul	41	41¾
" Pref	81¾	81⅝
Standard	29¾	30
Sutro Tunnel	4⅛	4¾
Union Pacific	72⅝	72⅞
Wabash	33	33⅞
Western Union Telegraph	103	103⅛

GENERAL HARDWARE.

Business continues fairly active, and in some lines of goods, particularly Edge Tools and Agricultural Implements, the demand is very encouraging. The complaint of small profits, so often echoed of late, still prevails, and it is often wondered at, in view of the active demand which has prevailed since the opening of the season, that this evil has not been regulated. In some branches of the trade there is a tendency toward higher prices, and we think that the tone of the market is steadily gaining strength.

In Foreign Hardware there is nothing new to report. Prices are firm, and the demand, although not active, is seasonably fair.

The American Screw Company have issued the following circular, to which is added their price list for Rivets, Burrs, &c. The only change in list prices is the new list for Burrs, which we print below. The discount from list of Tinned Belt Rivets and Burrs is 35 per cent.:

PROVIDENCE, April, 22, 1879.

GENTLEMEN: Asking your attention to the revised price list of Burrs, Black and Tinned, and to advance in price of Rivets in bulk, on and after this date, we quote as follows:

Iron Black, Iron Tinned Rivets, (in papers of M.) } 50 per cent. dis.
Block and Carriage Rivets, (in papers of C.) }
Iron Rivets in bulk ..... -35 " "
Terms: Cash within 30 days from date of invoice.

Any party purchasing and receiving $250 worth or more of Iron Rivets and Burrs, during the six months ending June 30 or Dec. 31, shall be entitled to an additional discount of 7½ per cent. Delivery made at all principal points on or east of the Mississippi River. Prices not guaranteed and subject to change without notice. Soliciting your orders, which shall have our careful attention, we remain,

Yours very respectfully,
AMERICAN SCREW COMPANY.

BURRS—BLACK.
Revised April 10th, 1879.

Nos....14 13 12 11 10 9 8 7 6 and larger.
Price ..45 40 35 35 30 30 30 25 cts. per lb.
Burrs—Tinned, 6 cts. per lb. additional.

The Manufacturers of Sad Irons, namely, Bless & Drake, Newark, N. J.; Brendlinger & Co., Pottstown, Pa.; Wm. Shimer, Sons & Co., Freemansburg, Pa.; J. D. Steel & Son, Pottstown, Pa., have jointly issued a circular advancing the price. They say: "In view of the low and unremunerative price at which Sad Irons have been sold during the past year, a meeting of Sad-Iron makers was held at Pottstown, Pa., on the 25th instant, when it was deemed best to advance the price, feeling assured that it will be to the advantage of the trade as well as to themselves." New York houses quote the goods at 2¾ cents per pound, net.

The inquiry for Nails is not so active as it was prior to the advance in the card rate, but still there is a fair amount of business doing in small lots, and the tone of the market is firm. We continue to quote 10d. to 60d., $2.25, net.

The copartnership heretofore existing under the name of Sargent and Brother, manufacturers of Cotton, Wool and Horse Cards, &c., of Leicester and Worcester, Mass., has been dissolved by its own limitation and by mutual consent. The business of the late firm will be carried on by the Sargent Hardware Company, Worcester, Mass. Among "Special Notices" on the opposite page further particulars will be found, to which we invite attention.

The following circular explains itself:

CAUTION.

To the Hardware Trade.—The Enterprise Manufacturing Company and the American Machine Company, of Philadelphia, who have the sole right to manufacture and sell the Mrs. Potts' Cold Handle Sad Irons, having learned that certain Sad Irons marked "J. W. Williams & Son, Chagrin Falls, Ohio," and which are a direct infringement upon the reissued letters patent for the Mrs. Potts' Iron, are being offered to the trade, hereby caution the trade against purchasing and dealing in the said infringing Sad Irons.

The manufacturers have been warned to desist from making them, and advised that their refusal to do so will result in litigation.

The trade should bear in mind that infringers of letters patent, whether they be the makers or the sellers of the infringing articles, are alike liable; therefore, if they handle the goods referred to, they will do so at the risk of a lawsuit. The undersigned, as owners of the Mrs. Potts' patent, will bring prompt and vigorous suit against infringers of said patent, whether manufacturers or dealers.

ENTERPRISE MFG. CO., of Pa.
AMERICAN MACHINE CO.

Tennis & Wilson, 82 Reade street, have been appointed agents for the "Paragon" Fly Traps, manufactured by Bromwell Mfg. Co., Cincinnati, Ohio, and will carry a stock of these goods. They quote "Paragon" Fly Traps, $3 per dozen, net, with a special discount for quantity orders.

We have received the following joint circular:

BEAVER FALLS, PA., April 8, 1879.

DEAR SIRS: We beg to inform you that we have appointed Messrs. Alfred Field & Co., of 93 Chambers and 75 Reade streets, New York, our general agents for the sale of the Western Files. Messrs. Alfred Field & Co. are so well known to the trade, being a house of 43 years' standing, that they need no introduction from us, and our Files have such a well-established reputation that it is only necessary for us to say that we are continually improving the quality and make. Soliciting a continuance of your valued orders,

Very truly yours,
WESTERN FILE CO., LIMITED.

[*Established* 1836.]
93 CHAMBERS AND 75 READE STREETS,
NEW YORK, April 8, 1879.

DEAR SIRS: Referring to the annexed announcement, we have pleasure in informing our friends and the trade generally that we shall carry a full assortment of the Western Files in stock in New York, and that we will also ship direct from the factory, when advantageous to buyers.

We are absolute headquarters as to price, and all orders will be filled by us at same prices and terms as if sent to the factory direct.

Soliciting your orders, we are, gentlemen, yours very truly,

ALFRED FIELD & CO.

P. S.—All files are warranted.

G. B. Walbridge has in press the following announcement:

The partnership heretofore existing between us, under the firm name of G. B. Walbridge & Co., has been dissolved by mutual consent. The business will be continued by G. B. Walbridge, who will liquidate the business of the late firm.

GEORGE B. WALBRIDGE.
VAN VECHTEN TROTTER.

103 CHAMBERS STREET, N. Y., May 1, 1879.

DEAR SIR: I have removed to the store No. 103 Chambers street, where I shall continue the Hardware Commission and Manufacturers' Agency business, and the manufacture of Lyons's Patent Punches, Shears, Presses, &c. GEORGE B. WALBRIDGE.

The Penn Hardware Company, of Reading, Pa., have made arrangements with Mr. Merle Middleton, who will represent them in Philadelphia. A full line of their goods will be kept in stock at 506 Commerce street. The Yale Lock Manufacturing Company have also opened a branch office in Philadelphia, which will be under the same management. They have issued the following:

STAMFORD, CONN., April, 1879.

DEAR SIR: We beg to inform you that we have just opened a branch office and salesroom in Philadelphia, where we intend carrying a fully assorted stock of our various manufactures.

We have placed our Philadelphia office in charge of Mr. Merle Middleton, as manager, who will be pleased to show you our line of samples and to receive your valued orders, the execution of which will always have our prompt and careful attention. Respectfully, THE YALE LOCK MFG. CO.

Philadelphia salesroom, 506 Commerce street.

There is an active demand for Lawn Mowers and a large variety to select from. The Russell & Erwin Mfg. Co. are agents for the "Charter Oak" and "Archimedean," which they quote for the season of 1879 as follows:

CHARTER OAK LAWN MOWERS.

Inch	8.	10.	13.	15.	18.
Each	$8.00	10.00	13.00	15.00	18.00

Discount, 10 per cent.

ARCHIMEDEAN LAWN MOWERS.

Inch	8.	10.	12.	14.	16.	18.
Each	$8.00	10.00	13.00	15.00	18.00	20.00

Discount, 10 per cent.

HORSE LAWN MOWERS.

28 inch ..... $100 | 32 inch $125
Discount, 30 per cent.

Horace Durrie & Co., 97 Chambers street, quote the "Pennsylvania" Lawn Mower at the following list, which is subject to discount 30 per cent.:

PENNSYLVANIA LAWN MOWER.
Price List.

Width Cutter.	Driving Wheels.	Power Required.	Weight. Lbs.	Price.
10 in.	8 in.	A Child	30¾	$14.00
12 in.	8 in.	A Lad	33½	18.00
14 in.	8 in.	A Lady	36	20.00
16 in.	8 in.	One-Man Size	38	22.00
18 in.	8 in.	One-Man Size	41	24.00

New Machines.

Width Cutter.	Driving Wheels.	Cylinder.	Power Required.	Weight Lbs.	Price.
15 in.	10½ in.	6½ in.	Man Size	48	$22.00
17 in.	10½ in.	6½ in.	Man Size	51	24.00

Sargent & Co. quote "Excelsior" Lawn Mowers at discount 25 and 10 per cent. from the annexed list. A new style of the "Excelsior" Lawn Mowers is offered this year, in addition to the machines with which the trade are familiar. They are Side-Wheel Mowers, and are thus described in a circular:

This Mower possesses many important advantages over any other side-wheel mower. It has patent self-cleaning gears, which cannot clog; it is noiseless in its operations; it has an improved ratchet without spring to get out of order; its adjustments are more simple, and it is the lightest and best Side-Wheel Mower in the market.

EXCELSIOR LAWN MOWERS.
8 to 20 inch Roller Mowers.

10-inch Cut	$14.00	16-inch Cut	$22.00
12 "	18.00	18 "	24.00
14 "	20.00	20 "	28.00
15 "	21.00		

12 to 20 inch Back-Wheel Mowers.

12-inch Cut	$18.00	18-inch Cut	$24.00
14 "	20.00	20 "	28.00
16 "	22.00		

NEW PATTERN EXCELSIOR LAWN MOWERS.
10-inch Croquet Mower—12 to 20 inch Side-Wheel Mower.

10-inch Cut	$10.00	16-inch Cut	$22.00
12 "	18.00	18 "	24.00
14 "	20.00	20 "	28.00

NEW EXCELSIOR HORSE LAWN MOWERS.

25-inch Cut, without Shafts or Seat		$75.00
30 " with Shafts and Seat		125.00
35 " " " "		160.00
40 " " " "		200.00

The 25-inch Mower is furnished with Shafts when desired. Price, $10.

Graham & Haines, No. 113 Chambers street, have in stock an assortment of "The Ohio" Lawn Mowers, for which they are agents. They quote these Machines at the following list, which is subject to discount 30 per cent. For orders of 10 Mowers at one time an extra discount is allowed.

THE OHIO LAWN MOWER.

12 inch cut	$18.00
14 " "	20.00
16 " "	22.00

Sickels & Preston, Davenport, Iowa, illustrate in their advertisement, on page 24, a Pincers specially constructed for converting Staples into Barbs upon ordinary Fence Wire. They claim that these Pincers afford the most convenient way for making a barbed fence, and that by their use ordinary wire fencing is made absolutely cattle proof. These Pincers have been in use for several years in many of the Western States, and are spoken highly of by farmers who have thoroughly tested them. Since their introduction they have been greatly improved, by lengthening and bowing the handles. Sickels & Preston also furnish their No. 12 "S. P. & A." Staples made of steel, which they recommend as being the best and cheapest in use. They are ⅞ inch long and number 285 to the pound.

The Gilbert & Bennett Mfg. Co., Georgetown, Conn., and No. 273 Pearl Street, New York, have issued a handsomely illustrated catalogue, in which they show a large assortment of Flour, Meal and Oat Sieves, Ash Sifters, Foundry Riddles and Barrel Covers, Cheese Safes, Coal Screens and kindred goods. They show also a full line of Wire Cloths for manufacturing and other purposes, and their assortment of Galvanized Wire Netting for Fencing, Poultry Yards, &c., is very complete. They are among the largest manufacturers of Wire Netting in this country, and are in a position to fill orders promptly. In their advertisement on page 18 they present an assortment of sizes of Wire Netting, and they illustrate their Meat Safes, which are shown set up, and folded for shipping. They claim that their Coal Screens, which are illustrated in the advertisement referred to, are superior to any in the market, being framed in hard wood specially prepared, and wired with Iron and Steel of superior quality. In addition to Wire goods, their catalogue contains an assortment of Coal Shovels, Coal Hods, Pokers, &c.

The American Tack Company will remove on May 1st to No. 116 Chambers street, opposite their old stand, where they will carry, in addition to their usual assortment of Tacks and Nails, a full line of the Old Colony Rivet Company's Rivets.

H. Clark has disposed of and transferred his interest in the Snell Manufacturing Company, of Fiskdale, Mass., to Tennis & Wilson, of this city. A notice to this effect will be found on the opposite page.

We invite attention to the advertisement of the Miles Alarm Till Manufacturing Company, of Providence, R. I., on page 26. This company manufactures several styles of double and single-locking alarm tills, which can be seen in this city at the warehouse of their agents, Fairbanks & Co., No. 311 Broadway.

The Lalance and Grosjean Manufacturing Company have issued, under date of 24th inst., a circular, from which we extract the following:

TO THE TRADE.

The list on Patent Threaded Tea, Table and Basting Spoons, Ionic and Silver Steel Spoons and Forged Basting Spoons remains the same. Discounts from this date will be as follows, viz.:

	Dis. per c't.
F. Grosjean's patent threaded table and tea spoons, less than case	40
F. Grosjean's patent threaded basting spoons, less than case	40
"Ionic" table and tea spoons, less than case	60
"Silver steel" table and tea spoons and table forks, less than case	55
Wood-handled preserve spoons, less than case	55
Loop-handled basting spoons, less than case	50
Forged basting spoons, less than case	40

Five per cent. cash in 30 days; limit of time without interest, 4 months.

In case lots an extra discount is allowed. We print below their revised price list:

F. Grosjean's Patent Threaded Tea Spoons.

	Riveted.	Solid.		
No	300	305	310	320
Inches	6	6	6	6
Tinned, per gross	$3.75	4.00	4.50	4.75

"Case lots," 12 gross of any one number.

F. Grosjean's Patent Threaded Table Spoons.

	Riveted		Solid Strong		
No	60	62	40	41	42
Inches	7¾	8¼	7¾	8	8¼
Tinned, per gross	$6.00	6.50	7.00	7.25	7.50

	Solid Extra Strong		
No	20	21	22
Inches	7¾	8	8¼
Tinned, per gross	$8.00	8.50	8.75

F. Grosjean's Patent Basting Spoons.
Tinned.

Inches	10	12	14	16	18	20
Solid, per doz	$1.35	1.55	1.75	2.00	2.25	2.45

Inches	10	12	14	15	18
Riveted, per doz.	$1.10	1.20	1.40	1.60	1.80

"Case lots," 24 doz., assorted.

"Ionic" Spoons, Oval Threaded.

	Table.	Tea.
No	38	19
Inches	8¼	6
Per gross	$13.00	7.50
"Case Lots"	6 gross.	12 gross.

Superior Silver Steel Spoons, Oval Thread, Patent.

	Table.	Tea.
No	7	2
Inches	8¼	6
Per gross	$13.00	7.50
"Case Lots"	6 gross.	12 gross.

Superior Silver Steel Spoons, Olive, Patent.

	Table.	Tea.
No	8	3
Inches	8¼	6
Per gross	$13.00	7.50
"Case Lots"	6 gross.	12 gross.

Superior Silver Steel Table Forks, Oval Thread, Patent.

No	70
Inches	7⅜
Per gross	$15.00
"Case Lots"	6 gross.

Superior Silver Steel Table Forks, Olive, Patent.

No	80
Inches	7⅜
Per gross	$15.00
"Case Lots"	6 gross.

Preserve Spoons, Wood Handled.

Inches	10	12	14	16	18
Tinned, Per doz.	$1.40	1.60	1.80	1.90	2.00

Loop-Handled Basting Spoons.

Inches	10	12	14	16
Tinned, per doz.	$1.50	1.70	1.90	2.00

"Case Lots," 24 dozen, assorted.

Forged Basting Spoons.

Inches	10	12	14	15	18
Tinned, per doz.	$1.50	1.75	2.00	2.25	2.50

"Case Lots," 24 dozen, assorted.

John Chatillon & Sons, scale manufacturers, Nos. 89 to 93 Cliff street, illustrate in their advertisement on the thirtieth page some of their leading styles of counter scales, spring balances, scale beams, scoops, &c., to which we invite attention. Their assortment of these goods is large, and, for accuracy and good workmanship, they will compare favorably with any similar line on the market. Their illustrated catalogue will be mailed to the trade on application.

IRON.

American Pig.—The market for Pig metal remains in the healthy condition so frequently noticed of late. The shipments for April are reported as being heavier than in any month during the past five years. It will be understood that these shipments are, for the largest part, on orders taken early in the season, but there is still a good deal of inquiry for good brands, and if orders for early delivery could be placed as they are offered, our reports of transactions would run into much larger figures than they have done during the month which closes to-day. Stocks of prime Lehigh brands are light, and prices continue firm at our quotations. The Thomas Iron Company report sales during the week of 1500 tons Nos. 1 and 2 X, at $18.50 and $17, respectively. A sale is also reported of 500 tons No. 2 X North River Iron, and about 500 tons of Iron for California, the brand of which we did not learn. A feature of this season's business is the growing demand for Lehigh Irons for Western account, and frequent shipments are reported. In addition to the sales mentioned above, a fair business, in lots, of various grades and brands, aggregating about 3000 tons, has transpired since our last writing. The demand for Bessemer Iron is so great that the furnaces at present employed in its production are utterly inadequate, and steps are in progress to increase the product materially. It is expected that before many months eight additional furnaces will be in operation. We quote: Fonndry, No. 1, $18 @ $19; Foundry, No. 2, $17 @ $18; Gray Forge, $16.50.

Scotch Pig.—The market is very quiet in the matter of Scotch Iron, and sales during the week have been unusually light. No arrivals are reported. We quote, nominally, Eglinton, $19.50 @ $20, and Coltness, $22.

Rails.—The market for both Steel and Iron Rails has been active, and sales are reported of three lots of Iron Rails aggregating 23,000 tons, and two lots of Steel Rails, respectively, 5500 tons on private terms and 2000 tons at $45, at tide-water. We hear also of active inquiry for additional lots of Steel Rails, but for earlier delivery than the mills can undertake in the crowded condition in which they are at present. We quote Steel Rails at tide-water, $45, and Iron, $32 @ $36, according to quality, section, terms, &c.

Old Rails.—The only transaction we hear of is a sale of 500 tons on private terms. We quote as before, $20 @ $21 here.

Scrap.—Prime Scrap Iron, although not quotably lower, is not as easy to dispose of at the high figures ruling as it was a few weeks ago. No sales worthy of mention have come to our notice during the week. Holders continue firm in their views at $24 @ $25 from yard for No. 1 Wrought.

METALS.

Copper.—The market here has been quiet but firm, sales summing up 100,000 pounds Lake Superior, in lots, at 16c.; Baltimore may nominally be quoted about as much. Advices by cable are to hand from London, the quotations being lower. Best Selected being worth £63 and Chili Bars £57, a decline chiefly due to the Wallaroo sale referred to in our last week's issue. Mail advices have been received to April 17, when Best Selected commanded £64 @ £65. The following remarks are added: "The advices from Chili and Bolivia, showing that war is progressing in those countries, is chiefly what occasioned the better tone in our Copper market, and if the hostilities which have broken out in these parts should be prolonged to any lengthened period, there is every reason for supposing that Copper will considerably advance in value, especially if producers are sensible in limiting their output, by which means a great reduction might take place in stocks and a greatly better price follow for some considerable time. The depreciation has been brought about by over supply, and the only remedy left now is to act in the opposite way. No improvement can permanently be effected in the market until its stability is insured, and the quickest way to restore confidence will be by the publication of reduced statistics. The question of price rests with sellers, and according as they may increase or decrease imports, so the market will rise or fall. It is somewhat difficult to understand why sellers should so persistently continue to spoil their own market, when by the exercise of judicious management they could so easily obtain a much higher figure for their produce." London speculators have had such sad experience in Copper of late years that they have become ultra cautious. We have also received papers from Chili as late as the last week in March, when Peru had not yet declared war, but it was looked upon as unavoidable, Peru having insisted upon a positive assurance that Chili would, in any event, retain none of the invaded Bolivian territory permanently. This assurance not having been given, it became

a *casus belli*, and the feeling is intense on both sides. The Bolivians are incensed all the more, as they are in the midst of a famine and have been for some time past. From all appearances the war will be a most embittered and possibly a protracted one, the belligerents being well matched. The market for Manufactured Copper is steady and the demand generally supplied at combination prices, which are unchanged. We quote: New Sheathing Copper, 22¢; Braziers', 24¢; and Bolts, 24¢; Bottoms, 26¢; American Yellow Sheathing Metal, 13½¢; Yellow Metal Bolts, 20¢; and English Yellow Sheathing Metal, 12¢ @ 12¼¢, currency, in bond.

Tin.—Our market continues quiet and lifeless, and we quote Straits on the spot, 14½¢ @ 14⅝¢. About 5000 slabs Straits arrived here this week; heavy imports may be looked for during the next fortnight. London cables Straits £68, and Singapore, $21.50 per picul. We quote: English refined and common, 15¢; and Banca, 17½¢ @ 17¾¢, all large lines. The following is by mail from England, dated April 17: "Foreign tin has advanced again this week and English has followed, though not quite to the same extent. Values to-day are: Lamb and Flag, £70; Refined, £71; Straits, £70." *Tin Plates.*—We receive the following from Liverpool, under date April 17: "Mak rs h ve in the meantime determined not to close another day a week, and consequently market is weaker than when this was uncertain. Still sellers are fairly firm and don't seem greedy for orders. This being, owing to the Easter break, rather an exceptional week, we must wait a few days to see the actual position of affairs." On the whole there is a better feeling in the Tin Plate markets, the expectation being that prices will be maintained, owing principally to the fact that the season has now fairly advanced, and that from all indications the consumption is quite large. We quote large lines, ordinary brands, per box, as under: Charcoal Bright, $6.25 @ $6.50; Charcoal Ternes, $5.75 @ $6.00; Coke Tin, $5.25 @ $5.50, and Coke Ternes, $5.00. There is nothing of special interest by cable from England.

Lead.—Sales since last week sum up about 250 tons, an aggregate of a great many small lots, beginning at 2.95¢ and selling down to 2⅞¢ at the close, most of the Lead sold going at the last-named figure. The market is still dull, with only 2¾¢ bid for parcels, and the jobbing demand very light. The stock is increasing, the Lead going into store. There are now 10,000 tons here and 2000 tons afloat, with perhaps 1000 tons in transit by rail. They write from England under date April 17: "Lead is easing down, to-day's price being, English Pig, £14. 12/6 and Spanish, £14. 5/." Manufacturers prices are unchanged. We quote Bar, 4½¢; Pipe, 5¢; Sheet, 6¢; Tin-Lined Pipe, 12¢; No. 1 Solder, 10¢; all less 10% to the trade.

Spelter.—The business in Spelter is at a standstill, only small sales being reported at 4½¢ @ 4¾¢. We quote: Refined, 8¢ @ 8¾¢; Silesian, 5⅜¢ @ 5¾¢, nominally, and Berganport, from Lehigh ore, 9¢. *Sheet Zinc* is worth 6½¢.

Nickel—Is moderately actively at $1.25. Accounts are to hand from New Caledonia, where mining and all industries were gradually reviving, the country now being thoroughly pacified.

Antimony.—The jobbing demand existing for this metal is supplied within the range of 11⅜¢ @ 12¢, according to brand.

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending April 29, 1879:

Hardware.

Ansonia Clock Co.
  Mdse., pkgs., 4
Arnzon & Wilzinsky,
  Mdse., pkgs., 22
Baldwin Bros.
  Tubes, cs., 2
  Mdse., pkgs., 37
Barbour Bros.
  Machinery, cs., 6
Bartram Bros.
  Sew. mach., crate, 1
Blumenthal A. & S.
  Mdse., pkgs., 8
Boker Hermann & Co.
  Hdw., pkgs., 507
Brown W.
  Scales, cs., 1
Cabble E.
  Brass wire, pkgs., 13
Charles R. P.
  Grindstones, 2194
De Planque E.
  Mdse., pkgs., 8
Eggers & Heinlein,
  Copying press, cs., 1
Erie & North Shore Line,
  Mdse., pkgs., 7
Fales Thos. J.
  Arms, cs., 2
  Mdse., pkgs., 1
Folsom H. & D.
  Arms, cs., 3
Hecht Bros.
  Mdse., pkgs., 16
Hermann H. & Co.
  Mdse., pkgs., 7
Herring & Co.
  Iron-safe door, 1
Hopkins E. T.
  Mdse., pkgs., 10
Howard, Sanger & Co.
  Mdse., pkgs., 1
Lewis Bros.
  Mdse., pkgs., 9
Lichtenberg Chas.
  Mdse., pkgs., 13
Livingstone W. & F.
  Grindstones, 1532
McCoy & Co.
  Mdse., pkgs., 9
Moore's J. P. Sons,
  Arms, cs., 3
  Mdse., pkgs., 2
Rogers Henry.
  Mdse., pkgs., 3
  Gauge glasses, pgs. 8
Schoverling, Daly & Gales,
  Arms, cs., 1
  Mdse., pkgs., 4
Siegmann Bros.
  Hdw., cs., 3
Struller, Lau & Co.
  Mdse., pkgs., 2
Thebaud Bros.
  Sew. mach., cs., 1
Thompson C. M.
  Wire rope, cks., 15
Ward Asline,
  Mdse., pkgs., 2
Weingarten Edward,
  Mdse., pkgs., 1
W. U. Telegraph Co.
  Mdse., pkgs., 2
Wetzlar M.
  Mdse., pkgs., 2
Wiebusch & Hilger Hdw. Co.
  Anvils, hdw. and cutlery, pkgs., 319
Wolff S. N. & Co.
  Mdse., pkgs., 11
Woodruff A. J. & Co.
  Mdse., pkgs., 3
Order,
  Chains, cks., 10
  Emery stone, tons, 100
  Files, cks., 8
  M'ganese ore, bbls., 33
  M'ganese ore, cks., 42
  Sulphur, tons, 300

Iron.

Corbin P. & F.
  Pig, tons, 50
Marvel Wm. D.
  Ore, tons, 732½
Naylor & Co.
  Quantity of scrap
Pierson & Co.
  Bundles, 38
Williamson Jas. & Co.
  Pig, tons, 100
Williken & Smith,
  Wire rods, bdls., 525
Order,
  Ore, tons, 2130
  Oxide, cks., 20
  Pig, tons, 250
  Sheet iron, bdls., 160

Steel.

Brown W.
  Bundles, 157
  Cases, 3
Wolff R. H. & Co.
  Bundles, 151
Woodford W. O.
  Bundles, 62
  Bars, 12
  Cases, 3
Order,
  Cases, 17
  Casks, 5

Metals.

Agostini Jos.
  Old copper, bxs., 5
Baring Bros. & Co.
  Tin, slabs, 2464
Bruce & Cook,
  Tin plates, bxs., 389
Meyer Moritz,
  Lead, bars, 4307
Middleton & Co.
  Yellow metal, bxs., 2
  Yellow metal gougings, bxs., 2
Naylor & Co.
  Tin plates, bxs., 2673
Phelps, Dodge & Co.
  Tin plates, bxs., 8939
Pratt Chas. & Co.
  Tin plates, bxs., 1470
Order,
  Silv. ore, seroons, 12
  Tin plates, bxs., 20,548
  Tin, slabs, 2694

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending April 29, 1879:

Danish West Indies.

	Quan.	V'lue.
Ptlm., gals..	960	$124
Sew. mach., cs	2	36
Tacks, cs.....	10	75
Notions, cs...	18	235
Glassw're, pgs	19	219
Nails, kegs....	62	199
Hdw., cs......	30	384
Cartridges, cs.	2	128

Antwerp.

Mach'y, cs....	2	160
Mf. iron, pkgs.	23	450
Lub. oil., bbls.	50	495
Ptlm., gals	367,689	37 768

Hamburg.

Lub. oil, bbls..	169	1,932
Ptlm., gals.	542,812	50,322
Ag. imp., pkgs	64	3,771
Sew. mach., cs	487	5,787
I. rollers, cs..	3	703
Hdw., cs......	184	4,293
Plt'd ware, cs.	4	455
Spelter, slabs	2,689	8,060
Belting, cs.....	7	1,576
Mach'y, cs....	37	3,651
Gas fixt's, cs..	3	77
Pumps, pkgs.	3	763
Packing, pkgs	6	250
Mf. iron, pkgs	14	669

Dutch West Indies.

Ptlm., gals..	466,190	67,004

Christiansand.

Ptlm., gals.	109,447	10,397

Rostock.

Ptlm., gals.	123,107	17,220

Stettin.

Ptlm., gals.	146,749	13,915

Dutch West Indies.

Sew. mach., cs	4	114
Tinware, cs...	4	105
Ptlm., gals...	1281	159
Nails, kegs....	25	73
Hdw., cs......	102	1,453
Mf. iron, pkgs	17	120
Glassware, cs.	4	90
Wire g'ds, pgs	18	86
Plt'd ware, cs	6	695
Revolvers, cs..	1	53

Bremen.

Hdw., cs......	9	392
Glassware, cs.	9	128
Belting, cs....	2	224
Ptlm., gal	1,043,647	99,935
Ag. imp., pkgs	222	4,580

Rotterdam.

Ptlm., gals.	235,824	21,000
Lub. oil, gals.	1,638	16,410
Slates, cs ...	47	181
Ag. imp., pkgs	20	1,000
Pumps, pkgs.	14	881
Clocks, bxs....	14	339
Car wh'ls, prs	24	430
Copper, cks...	90	16,875
Gas burn's, cs	1	300
Hdw., cs......	51	1,335

Danzig.

Ptlm., gals.	180,069	18,000

Hull.

Hdw., cs......	2	73
Mach'y, cs....	1	566
Ag. imp., pkgs	210	12,640

Liverpool.

Ag. imp., pkgs	378	11,642
Mach'y., cs...	28	3,079
Hdw., cs......	44	2,757
Pistols, cs....	5	1,200
Lub. oil, gals.	4644	2,786
Glassware, cs..	7	350
Car wheels...	48	289
Oxide z'c, bbls	50	348
Gatling gun...	1	1,000
Lea. b't'g, bxs	3	1,368
Plt'd ware, cs.	2	225

Cardiff.

Hdw., cs......	7	168

Bristol.

Cop. ore, tons.	23	1,510

Tyne Dock.

Lub. oil, bbls.	25	100

Gibraltar.

Mach'y, case..	1	20
Ptlm., gals..	20,500	2,515
Ptlm., gals.	162,000	17,920

London.

Hdw., cs......	67	2,384
Sew. mach., cs	36	7,185
Carbon, hhds.	100	900
Slates, cs.....	25	125
Ox. zinc, bbls	100	735
Mach'y, cs....	31	2,172
Mf. iron, pkgs	8	111
Ag. imp., pkgs	259	3,356
Metal g'ds, cs	1	598
Glassware, cs.	20	30
Belting, cs....	2	484

Glasgow.

Sew. mach., cs	290	5,224
Bird cages, cs.	5	145
Hdw., cs......	11	150
Belting, cs....	2	1,187
Mach'y, cs....	5	500
Ag. imp., pkgs	115	4,800
I. rolls, cs.....	3	600

British North American Colonies.

Lub. oil, bbls..	18	87
Ptlm., gals...	3,703	499
Coal, tons.....	170	850
Glassware, cs.	28	148

Bordeaux.

Ptlm., gals.	222,316	19,035

British West Indies.

Glassware, pgs	83	375
Hdw., pkgs...	24	344
Nails, kegs....	59	167
Mach'y, pkgs.	3	700
Sew. mach., cs	3	88
Plt'd ware, cs.	4	82
Coal, tons.....	184	461
Mf. iron, pkgs	17	209
Ptlm., gals.	35,100	4,409

British Guiana.

Trucks........	12	38
Petl., gals....	8,000	600

Havre.

Arms, cs......	1	500
Sew. mach., cs	338	3,925
Ag. imp., pkgs	541	17,756
Mach'y, cs....	6	750

Barcelona.

Hdw., cs.......	3	225

Malaga.

	Quan.	Value.
Ptlm., gals	138,120	$15,500

Cadiz.

Sew. mach., cs	1	25
Cartridges, cs.	26	615
Hdw., cs......	5	283
Rifles, cs......	11	2,233
Mf. iron, pkgs.	6	52

United States of Colombia.

Sew. mach., cs	231	4,420
Ag. imp, pkgs.	5	162
Belting, pkgs.	4	174
Nails, kegs ...	13	57
Pumps, pkgs..	9	347
Powder, lbs..	2,300	283
Cutlery, pkgs.	21	1,063
Hose c'ge, bxs	4	450
Zinc, pkgs....	5	125
Rifles, cs.....	4	919
Notions, cs...	16	3,877
Iron, pkgs....	165	402
Copper, sheets	6	85
Am'nition, cs.	800	10,000
Glassware, pgs.	10	215
Ptlm., gals...	4,270	617
Mf. iron, pkgs.	330	1,669
Plt'd ware, cs.	13	1,596
Mach'y, pkgs.	200	12,732
Truck bxs. cs	1	200
Hdw., pkgs...	165	3,472
Mat. inst., bxs	4	320
Cartridges, cs.	7	303
Revolvers, cs.	6	719
Steel, pkgs....	42	171
Lead, rolls....	2	56
Arms, cs......	153	35,160

Peru.

Hdw., pkgs...	93	2,226
Nails, kegs....	85	264
Sew. mach. cs	328	4,188
Ptlm., gals..	44,001	5,107
Mach'y, pkgs.	199	16,219
R.R.mtls., pgs.	240	1,578
Zinc, cs... ...	10	178
Cutlery, pkgs.	39	721
Ag. imp., pkgs	124	889
Glassw're, pgs	38	242
Mf. iron, pkgs	128	899
R. R. cars.....	9	25,000
Car mtls., pgs	179	3,842
Dead pipe, cs.	1	87
Tacks, cs......	2	23
Grindstones..	45	145
Pumps, pkgs..	3	431

Cisplatine Republic.

Hdw.. pkgs...	55	1,047
Pumps, pkgs.	3	150
Sew. mach., cs	5	75
Glassw're, pgs	96	1,200
Ptlm., gals..	10,000	1,200
Ag. imp., pkgs	125	1,755
Mach'y, cs....	5	125
Nails, cs......	20	75
Trucks, pkgs.	6	84

Africa.

Ptlm., gals.	150,000	21,000
Nails, kegs....	50	200
Hoop iron, bdls.	103	305
Nails, bxs.....	28	400
Mf. iron, pkgs.	5	72

Hayti.

Nails, kegs...	85	209
Nails, bxs. ...	16	22
Ptlm. gals....	6,687	803
Hdw., pkgs...	34	471

Mexico.

Sew. mach., cs.	18	478
Hdw., pkgs....	20	568
Mf. iron, pkgs	62	196
Ptlm., gals...	3,750	438
Cutlery, cs....	4	143
Lead, pkgs...	11	48
Nails, kegs...	38	105

Argentine Republic.

Ptlm., gals..	25,000	2,735
Pl'd ware, cs..	1	86
Cartridges, cs	5	76
Hdw., pkgs...	115	2,375
Ag. imp., pkgs	26	771
Rifles. case...	1	258

China.

Glassw'e, pgs.	16	160
Hdw., cs......	1	25
Petlm., gals	390,000	45,894
Pistols, case..	1	50

Brazil.

Mf. steel, pkgs	26	1,300
Sew. mach., cs	37	1,180
Nails, kegs....	60	187
Ptlm., gals..	27,300	3,104
Hdw., pkgs...	21	254
Ag. imp., pkgs.	44	105

Venezuela.

Petlm., gals.	13,711	1,674
Hdw., pkgs....	60	998
Sew. mach., cs	45	1,532
Cutlery, cs....	5	236
Mf. iron, pkgs.	28	233
Nails, kegs...	12	35
Mach'y, cs...	6	389

Porto Rico.

Petlm., gals..	9,226	1,097
Nails, pkgs....	38	95
Plum. mat., cs	8	232
Hdw. cs.....	111	985
Cutlery, cs...	2	68
Guns, cs......	1	89
Carriage......	1	250
Plt'd ware, cs.	2	340
Glassware, cs.	256	1,645
Sew. mach., cs	53	855
Iron shed.....	1	11,000
Notions, cs...	8	430
Mach'y, cs....	8	151

Cuba.

Nails, kegs...	349	874
Petlm., gals..	5,300	642
Pumps, pkgs..	3	462
Mach'y, pkgs.	416	14,471
Sew. ma., cs.	19	980
Boilers........	2	5,160
Cutlery, cs....	6	316
Coal, tons.....	2,666	6,377
Mf. iron, pkgs	21	215
Hdw., cs.....	255	2,820
Ag. imp., pkgs	19	965
Glassware, pgs	48	376
R. R. mtls, pgs	301	4,073
Steel tyres....	6	305

Seville.

Petlm., gals.	50,000	5,500

Lisbon.

Slates, cs......	30	130
Petlm., gals..	5,000	580
Cartridges, cs.	4	115

Genoa.

Coal tar, tons.	354	808
Ag. imp., pgs.	38	1,300

Salonica.

Petlm., gals	132,000	14,974

COAL.

The cold weather which has prevailed during the month of April has made trade during the month exceptionally good, especially in the retail trade in this city. Some dealers report greater sales this month than during any time for the past year. During the week the amount of Coal sold by the wholesale dealers has been rather small, a circumstance to be expected, as trade is usually light just before an auction sale. The manufacturers, however, have been purchasing freely, and we hear of several dealers who are sold for some little time ahead. The scarcity of vessels still continues, and is likely to be felt for some time to come, to the great advantage of owners and captains. It would seem that there is actually a scarcity of vessels in the coasting trade, and consequently the Coal freights are high. The auction sale, which took place yesterday, had no special feature worthy of remark. Prices continued their gradual decline, as shown by the figures which we give below. That "the bottom" cannot be far away, is shown by the very slight decline. If it were not for the known fact of a Coal war and also that a good deal of Coal is forced upon the market, it is doubtful whether there would be any further decline. Manufacturers are buying largely, and we think the greatest part of the Coal now coming to the market goes into their hands. Under the class of manufacturers of course we include all large consumers, like steamboat and steamship companies, as distinct from the dealers in Coal. In this city the yards as a general thing appear to be rather bare of Coal. Dealers here are apparently over eager to buy when Coal is at its very lowest point. Doubtless many of them will be disappointed, and will replenish their stocks upon a rising instead of a falling market.

Mr. Saward furnishes us with the following averages of the Scranton auction sale, which took place at noon to-day:

		Average.
5,000 tons of Steamer	sold at...............	$2.02½
25,000 " Grate	"	2.05
20,000 " Egg	"	2.09½
40,000 " Stove	"	2.39½
10,000 " Chestnut	"	2.28½

The following table gives the averages for all the sales during the present year:

	Steamer.	Grate.	Egg.	Stove.	Ches't.
April 9, 1879..	$2.06¼	$2.06¼	$2.09¼	$2.48¾	$2.27½
Mar. 26, 1879..	2.17½	2.19¾	2.18	2.51¾	2.34
Mar. 12, 1879..	2.17½	2.25	2.26¾	2.65	....
Feb. 26, 1879..	2.25	2.27	2.27½	2.64½	2.42¾
Jan. 29, 1879..	2.35	2.32⅛	2.32	2.75	2.39½

Taken altogether, the decline is very slight, and many of the companies and dealers here have not found it necessary to alter their prices—the Lehigh prices, for example, remaining the same as heretofore. The Pennsylvania Coal Company, however, have issued a circular a few cents below that which was issued after the last sale. Upon the whole, the market may be said to be unchanged, but with a brisk demand.

OLD METALS, PAPER STOCK, &c.

A downward tendency still prevails in the Old Metal market this week. With the exception of Wrought Iron, Stove Plate and Machinery Plate, which have advanced slightly, we note a general weakening of stock. The Rag and Paper Stock market is, if anything, less active than at our last review, although prices remain unchanged.

The purchasing prices offered by dealers for Old Metals are as follows:

Copper, heavy......... ..	per lb.	$0.12½	@	....
Copper Bottoms...	"	.10	@	....
Yellow Metal..............	℔ lb	.08½	@	....
Brass, heavy..............	"	.07¾	@	....
Brass, light	"	.07⅜	@	....
Composition, heavy.	"	.11½	@	....
Lead, solid................	"	.02⅜	@	...
Tea Lead................ ...	"	.02¼	@	....
Zinc.......	"	.03⅛	@	...
Pewter, No. 1....	"	.10	@	. .
Pewter, No. 2.	"	.08	@	...
Wrought Iron.............	pr ton.	$17.50	@	....
Light do...................	"	9.50	@	....
Stove Plate................	"	10.00	@	....
Machinery do..	"	11.50	@	....
Grate Bars	"	3.50	@	....

The prices current for Rags, &c., are as follows:

Canvas, Linen..................	per lb.	3 c.	@	3½c.
White Cotton, New..	"	4½c.	@	....
" No. 2....	"	1½c.	@	....
White, No. 1....................	"	3¾c.	@	4 c.
" No, 2......................	"	2 c.	@	....
Seconds...	℔ lb.	1½c.	@	..
Mixed, Woolen..................	"	2 c.	@	3 c.
Soft, do......	"	6½c.	@	7 c.
Mixed Rags................ ...	"	2 c.	@	3 c.
Gunny bagging...	"	3 c.	@	....
Jute butts..........	"	2¾c.	@	..
Kentucky bagging	"	2⅛c.	@	...
Book Stock.........	"	1¾c.	@	....
Newspapers.....	"	1¼c.	@	1½c.
Waste Paper and Scraps..... .	"	¾c.	@	....
Kentucky Bale Rope	"	4 c.	@	....
Tarred Shaking......	"	1 c.	@	1¼c.
Grass Rope		....	@	2½c.

Messrs. Du Plaine & Co., Philadelphia, under date of 29th April, quote the market prices for Old Metals as follows:

	Cents ℔ lb.		
Heavy Old Copper	14½	@	....
Light Tinned Copper........................	12	@	....
Copper Bottoms........................	11	@	....
Locomotive Copper and Tin Bronze....	13	@	....
Heavy Red Brass Scrap..................	10½	@	....
Light Red Brass Scrap..................	10	@	....
Heavy Yellow Brass Scrap..............	8	@	....
Light Yellow Brass Scrap..............	7	@	....
Old Lead Pipe..............................	2¾	@	....
Old Junk Lead (melted in mass)..........	2¾	@	....
Tea Lead..............................	2½	@	....
New Zinc Clippings........................	3½	@	....
Old Scrap Zinc........................	3	@	....
Old Battery Zinc........................	2½	@	....
Plumbers' Lead Joints.	3½	@	....
No. 1 Pewter..............................	10½	@	....
No. 2 Pewter..............................	5	@	....
Old Type Metal........................	4	@	....
Red Brass Turnings........................	7	@	10
Yellow Brass Turnings..................	5	@	6
Spelter Dross..............................	⅛	@	2½
Lead Dross..............................	⅛	@	2
Stereotype or Electrotype Plates.......	4	@	....

PHILADELPHIA.

Office of *The Iron Age*, 220 South Fourth St.
PHILADELPHIA, April 29, 1879.

We have again to report business as being in a satisfactory condition, the Iron trade in all its branches having been one of constant activity during the past four months. We hear some complaint that prices are not what they ought to be, but in every direction business appears to be brightening up. Locomotives, cars, tools and machinery of all descriptions appear to be in active demand, and a full force of men are at work in all the leading establishments in the city and vicinity, while many are working overtime. Shipbuilding is moderately active again, and, so far as can be seen, the Iron trade this year will be the heaviest since 1873, and quite likely to be the heaviest the trade has ever known. The building trade is dull, but with the working classes fully employed, an improvement in this line also can only be a question of time. Another season of bounteous crops, it is believed, will start the country on a period of greater prosperity than has ever been known, and this is what many regard as already assured.

Pig Iron.—The market remains in the same condition as noted in our late reports. The volume of new business has not been at all important, but deliveries on old contracts are called for with much greater rapidity than is usual. The capacity for production at present appears to be less than the consumption, and several of the leading furnaces hesitate about booking orders, unless deliveries are somewhat extended. There is some difference of opinion as to the course of the market in the immediate future, but, so far as we can see, there is no weakness in prices; and with such a large consumption as appears to be going on in all departments, there is very little prospect of change in buyers' favor. The price of Finished Iron is very much out of proportion to the raw article, but so long as the furnace companies can place their products without difficulty, concessions are not likely to be made. The idea of a reaction seems to have very little foundation, the leading idea being that, when the mills have run off their old contracts, they must get Pig Iron at lower rates, or else abandon their trade to competitors at other points. The advance in the West has not been equal to that on the Lehigh as yet, but we notice a hardening tendency in the Pittsburgh market, and the natural course of business will doubtless equalize prices, without causing serious disturbance in either market. The demand for Foundry Irons, particularly in New York and the East, is showing fresh signs of activity and life, so that a little temporary depression in this locality will probably be fully offset by a demand from other sources. The chances of lower prices for the present, therefore, appear to rest upon a very slender foundation, while depleted stocks and heavy consumption are facts that cannot be ignored. We notice that the Thomas Iron Company are putting a furnace in blast to replace one blown out for repairs. The Allentown Iron Company are prepared to blow in one, and the Moslem Furnace is also in course of preparation for lighting. Other furnaces have recently been turned on Bessemer Iron, which is scarce and in demand, with very little offering. Prices of most descriptions of Iron are nominally the same as last week, but buyers have more difficulty in placing orders for the best descriptions, and the market may be quoted very firm as follows: Gray Forge, $16 @ $17; No. 2 Foundry, $17 @ $17.50; No. 1 Foundry, $18 @ $19.50. Bessemer Irons are in demand at full prices, but none offered.

Muck Bar.—There is a good deal of inquiry, but buyers do not respond freely to the high prices generally asked. Sales have been made at equal to $31 @ $32, Philadelphia delivery, one lot of 600 tons being at medium rate, with more offered at $30, at mill

Blooms.—The market is steady and a fair business doing at about the following prices: Sunken Scrap Blooms (2464 lb), $38 @ $39; Northern Ore Blooms (2240 lb), $33 @ $37; best quality Charcoal Billets (2240 lb), for wire and steel purposes, $58 @ $60; Bars do., $62.50 @ $65; Sheet Iron Blooms, cornered (2464 lb), $53 @ $55; Cold-blast Charcoal Plate Blooms, $50 @ $53; run-out Anthracite, $45 @ $47.50.

Plate and Tank Iron.—The market is quite active, and the mills are better supplied with orders than they have been for a long time past. Prices show no improvement, however, and a good deal of business has been taken during the week at what seems to be unnecessarily low prices. With a light demand, some little shading would not cause surprise, but with such a demand as there is at present, the action of sellers is difficult to understand. Manufacturers claim that there has been no money in the business for some time past, and with advancing prices for the raw material, it is singular that finished Iron should show so much weakness. Ship Plate, as we noticed last week, was sold at $2.15, delivered in Philadelphia, and Boiler Plate seems to be just as weak in proportion. We quote Skelp Iron quiet at 1.9¢ @ 2¢; Common Plates, 2.2¢ @ 2.3¢; Tank Iron, 2.2¢ @ 2.4¢; C. No. 1, 2.4¢ @ 2.6¢; Shell Iron, 2.75¢ @ 2.9¢; Flange Iron, 3.7¢ @ 4¢; Solid Firebox, 4.85¢ @ 5¢, and Best Bloom, 5.5¢ @ 6¢.

Structural Iron.—There is nothing of special importance in this department of the Iron trade, but, as usual, business is quite active, and the mills are employed to their utmost capacity. Orders for something like 3000 tons have been entered during the past 10 days, being an additional amount for the elevated railways in New York. The recent orders at the shipyards have also given some impetus to the trade, Beams and Angles having been taken to quite a considerable amount. The demand for small lots is also quite active, and the general condition of the trade is in every respect satisfactory. Prices are steady, and for small lots we quote: Angles, 2.1¢ @ 2.3¢; Tees, 2.3¢ @ 2.4¢; Beams and Channels, 2.5¢ @ 2.7¢, according to specification.

Sheet Iron.—The demand during the week has not been important, but a fair business has been done, considering the season. The outlook is considered encouraging, with prices firmly maintained, and, so far as we can see, there is little prospect of lower figures than are now current. We quote for jobbing lots: Common Sheet, No. 20 to 23, 3.2¢ @ 3.3¢; No. 24 to 28, 3.4¢ @ 3.5¢; Best Refined Sheet, No. 25 to 28, 3.6¢ @ 3.7¢; No. 16 to 24, 3.4¢ @ 3.5¢; Best Bloom Sheets, No. 16 to 24, 5.5¢ @ 5.7¢; No. 25 to 28, 5.8¢ @ 6¢; Refined Plates or Blue Annealed, 5-16 to 16, 2.6¢ @ 2.7¢; Best Bloom, 5-16 to 16, 5.3¢ @ 5.5¢; A Patent Planished, 10½¢; B Patent Planished, 9½¢; Best Bloom Galvanized, 45% discount; second quality, 55%; extra discounts for large lots.

Bar Iron.—There is more business doing, and buyers inform us that they find very little encouragement at the mills, unless they are willing to pay the full current quotations of the day. Manufacturers still claim, however, that it is difficult to get prices in proportion to the increased cost of raw material; but the steady demand seems to impart a feeling of confidence in regard to the future, and it is expected that higher prices will be obtained as soon as the Western mills find a better market, which, it is believed cannot be long delayed. A large amount of orders could be taken at once if manufacturers were disposed to make concessions, but buyers hold off as much as possible when full prices are insisted upon. The market, therefore, for the time being, is somewhat feverish, with the tendency slightly in favor of the seller. In the meantime, sales are made at prices varying all the way from 1.7¢ @ 2¢, according to quality, with a considerable amount of business offered at medium rates.

Steel Rails.—There is nothing new to say in regard to the Steel Rail trade; the mills continue to be crowded with orders, and quite unable to accommodate many parties who desire to purchase for summer delivery. Some few orders of this class have been entered for small lots, but nothing important. For winter delivery there is more anxiety to secure business, but buyers seem to prefer taking the risk of the market. Prices appear to have reached their highest limit for the present, and a downward movement is not unlikely during the next six months. Manufacturers can doubtless afford to make concessions, as prices during the past six months are said to leave a fair margin for profit. There is no disposition to take advantage of buyers, and the unwillingness to sell is owing more to the difficulty of making deliveries than to a straining after higher prices. We quote same as last week, viz.: $42 @ $44 at mill, with somewhat lower figures for later deliveries.

Iron Rails.—Business has been quite active during the past week, and about 8000 tons have been placed since date of our last report. Nearly all are for delivery in the Northwest, and at prices which cannot leave much profit to the manufacturer. Small lots have sold to a moderate extent of full prices, say $35 @ $36.50, at mill, for light sections. Three 2500-ton lots of 56s have been taken at about $33.50, at mill, with $34 now asked.

Spikes—Continue very active at former prices, viz.: 5½ x 9-16, 2¼¢; ¼ x 4 and longer, 2½¢; 7-16 x 4 and longer, 2.6¢; ⅜ x 3½ and longer, 3¢.

Old Rails—There is a little more activity in the market, and quite a number of sales are reported, chiefly lots of two or three hundred tons each. For spot lots there is still a good demand, but buyers are cautious, and are evidently unwilling to anticipate their requirements, unless at lower figures than have prevailed of late. Sales during the week have been at $22, Philadelphia delivery, and in one instance about $22.25 was paid for a 1000-ton lot. We quote the market steady at the above rates.

Scrap Iron.—The market has been pretty well cleared of good stock, and transactions appear to be limited only by the quantity offered for sale. Wrought sells freely at $22.50 @ $24, and Cast at $13.50 @ $15.

Nails.—The market is firm at the advance, and a fair amount of business is reported at $2.25, which is now the regular quotation for wholesale lots.

PITTSBURGH.

Office of *The Iron Age*, 77 Fourth Avenue,
PITTSBURGH, PA., April 30, 1879.

The weather continues warm and spring-like, and vegetation hereabouts has made rapid development during the past week. In consequence of the backwardness of the season, everything is a little late, and farmers are now busily engaged in putting in their spring crops, on account of which local trade is slow, but the outlook is very encouraging.

In regard to our manufacturing interests, there is no improvement to note. There is a fair volume of business, but owing to strong competition, prices for nearly all of the leading articles of manufacture have been so reduced that there is no margin for profit. There appears to be a disposition manifested by some manufacturers to freeze out competitors and thereby secure a monopoly. Their policy is to keep prices down to or below actual cost of production, and thereby force those of their competitors who are not as strong as themselves into bankruptcy, or to stop their works. There has been a good deal of this freezing-out work going on within the past year or two, and there is reason to believe that some of those who have been engaged in pursuing it, while successful in accomplishing the object in view, have hurt themselves badly in so doing. There can be no improvement in the situation until one of two things occurs, viz., an increased consumption or a decreased production.

The labor question is still one of the leading topics of discussion in Iron circles, and considerable apprehension is felt in regard to the issue that will be brought to a focus June 18, when the arrangement between the puddlers and mill owners expires. It is said that some of the mills have already notified their puddlers that the price paid for puddling must be reduced after the expiration of the existing arrangement, but thus far there has been no concerted action on the part of the former, and it looks as if each mill would be left to do as may be deemed best under the circumstances. On the other hand, the puddlers, heaters and rollers are organized, and in this particular they have the advantage of the mill owners.

Pig Iron.—While there is a continued fair business, there is an absence of animation, and the outlook in regard to the immediate future of the market is not very encouraging. If, as now looks probable, there should be a lock-out, the consumption of Pig Iron must of necessity be very much curtailed, and with this in view the mills generally are buying only as their immediate wants require, and the feeling in regard to an improvement in prices is not as hopeful as it was a few weeks ago in consequence. There is and has been for some time past, more doing in Coke Irons smelted from native ores and the commoner grades of Anthracite, in consequence of the low price at which they are to be obtained. Coke Irons may be fairly quoted at $16, cash, @ $16.50, 4 mos., for Forge; $18, cash, @ $18.50, 4 mos., for standard brands of Forge from Lake Ores; $19.50 @ $20, 4 mos., for all-ore Red Short, and $21 @ $22, 4 mos., for Bessemer, according to grade. Charcoal blooms quoted from $45 to $55, 4 mos.

Manufactured Iron.—The situation has not changed materially since our last report; some mills report business falling off, while others still have all they can do, and we hear of a few having contracts for specialties sufficient to absorb their production for a year or more to come. The Hoop Iron trade has been very light here this spring, the Standard Oil Company, instead of dividing up their patronage as heretofore between the mills here and those in the valleys west of here, gave it all to the

valley mills, the price asked there being considerably less than the demanded by Pittsburgh mills. The contract in question is said to call for 5000 tons. There is a very fair demand for Sheet and Bars, which has been stimulated somewhat by the recent reduction in rail freights, our manufacturers being enabled to reach points from which they were shut out before. With a reasonable reduction in the cost of skilled labor, however, the trade of Pittsburgh would be largely increased, and we are satisfied that the Iron workers would make more money in the long run, as they would be afforded steady employment, and not be obliged, as many of them are, to be out of work half the time. Prices may be still quoted upon a basis of 1.70¢ @ 1.75¢, 60 days, for merchant Bars, with the usual discount of 2 per cent. for cash.

Nails.—The Nail market, so far as Pittsburgh is concerned, continues in the same demoralized condition noted from time to time all this year, and, what is still worse, there is not much prospect of any immediate change for the better. There is plenty of inquiry, and our manufacturers, if they were to accept current rates, could soon fill their books with orders, but they are refusing to meet competition, and the result is that business is almost at a stand. Some few of our factories are running about half time, with a view merely to holding part of their trade, while others are doing nothing. The trade is still reported quite active at Wheeling; most of the factories there are in operation, but as the cost of production is no cheaper there than here, it is evident that the Wheeling manufacturers are making no money; indeed, so far as we know, they do not pretend that current rates afford them any margin for profit, and it looks very much as if they expect to "freeze out" some of their competitors here, and at other points both East and West. The price at Wheeling is $1.90, 60 days, with 2 % off for cash. In Pittsburgh there is no established price.

Horse and Mule Shoes—Are still quoted at 3¼¢ and 4¼¢ in 100-keg lots, with special rates for larger lots.

Railroad Spikes.—There is no abatement in the demand, and no change in prices, 2¼¢ 30 days.

Wrought Iron Pipe.—There is an increasing business, but the market is in a demoralized condition, as prices, in addition to being irregular, have been cut to such an extent that there is very little margin for profit. Discount on Gas, Water and Steam Pipe, 65% @ 70%; Boiler Tubes, 47½% @ 50%; Oil Well Casing, 70% @ 75%, net; do. Tubing, 18% @ 20%. A typographical error in last week's report, made the discount on Boiler Tubes 47½% @ 70%. It should have been as quoted above.

Steel.—There is no apparent abatement in the demand; the mills are all busy and prices are firm, although unchanged, and the prospect is favorable for a good summer trade. Tool Steel, 10¢ @ 12¢; Machinery Steel, 5¢ @ 7¢; Boiler Plate, 6½¢ @ 7½¢.

Rails.—Steel Rails are still quoted firm at $44, cash, delivered on cars in Pittsburgh. The Edgar Thomson Co. is sold up until October. Old Iron Rails quoted steady at $22 @ $23 on spot, but owing to increased offerings the market is weak for forward deliveries. Old Steel Rails quoted at $25 @ $26.

Scrap.—There is a continued fair business, but no change in prices since our last of any consequence. One of our dealers, C. Kane, reports sales of 500 tons of Scrap Iron and Steel together. We quote: No. 1 Wrought Scrap, $22 @ $23, net; Wrought Turnings, $14 @ $15; Car Axles, 1.35¢ @ 1.40¢ ℔ lb; Car Springs, 1½¢; Boiler Iron, 1.10¢ @ 1.15¢; Old Car Wheels, $20 @ $20.50, gross; Old Castings, $14.50 @ $15; Cast Borings, $10.50 @ $11.

Window Glass.—The discount here in Pittsburgh has been reduced from 75 and 10 to 75 and 5 per cent. on car-load lots, and the same rate has been adopted by all manufacturers throughout the West. There is a continued fair demand, our manufacturers generally are well supplied with orders, and the prospect is considered favorable for a good spring and summer trade. Manufacturers say that in justice to themselves the discount should be reduced to 75% straight. The shipments both by river and rail have been quite large this spring, which may be attributed in part to cheap freights.

Coke.—As stated in our last report, the striking miners in the Connellsville Coke region have wisely abandoned the attempt to coerce the Coke operators to pay them an advance, and, having returned to work, nearly if not all the ovens are in operation again, and matters, so far as regards this important interest, are looking much better. Coke manufacturers fully realized that to increase the cost of production was simply suicidal, as it would undoubtedly have resulted in a large falling off in the consumption; hence their determination to resist the demands of the miners. There is no apparent falling off in the demand as yet, although the future depends largely upon the Pig Iron, as the Pig Iron furnaces are among the largest consumers of Coke. Prices are still quoted at $1.15 @ $1.25 per ton, delivered free on cars at ovens.

Coal.—The miners in the Monongahela and Youghiogheny valleys are generally at work, and the production is quite large; the water for the first time since the opening of navigation is now too low for running coal to the down-river markets, but there will no doubt be a rise within the next few weeks.

Petroleum.—The market for the raw article continues weak and depressed, and prices are lower now than they have been for five years; nor is it to be wondered at in view of the heavy production and unprecedented visible supply. If the bill now pending in the Legislature, requiring a license to be taken out for every new well started, becomes a law, the market will no doubt stiffen, as the effect of the same would be to curtail development. The export demand for Refined continues light, and prices are very low; it is probable, however, that the export trade will soon open up actively.

CHATTANOOGA.

Office of *The Iron Age*, Market and 8th Sts., Chattanooga, April 28, 1879.

General business continues slow and rather depressed. Manufacturing business shows no sign of slacking, and proprietors are hopeful of the future, and have no special difficulty in meeting demands on them by the raw material and labor markets. Spring has at length arrived in earnest. The weather during the week has been hot and dry, the thermometer reaching 80 degrees at mid-day as a rule, and seldom sinking below 55 degrees during the 24 hours. Rain is beginning to be needed badly. Crops of all kinds, excepting fruit, which was pretty thoroughly killed by late frosts, look just fair.

Pig Iron.—The movement shows no signs of brightening up, though there has been no appreciable concessions made to sell. Best grades of Foundry are still scarce. Coke Irons—No. 1 Foundry, $17.50 @ $18.50; No. 2, $16 @ $17; Gray Forge, $14 @ $15. White and Mottled $12 @ $13. Hot-Blast Charcoal—No. 1 Foundry, extra, $20 @ $21; ditto, $18 @ $20; No. 2 Foundry, $16 @ $18; Gray Forge, $16 @ $18; White and Mottled, $15. Cold Blast Charcoal—Car Wheel Metal, $22.50 @ $27.50; do., Extra Standard, $24 @ $29.50; Forge, $17 @ $22.

Muck Bar.—$27 @ $34. Old Rails, $18 @ $18.50. Old Car Wheels, $18. Wrought Scrap, $17 @ $19.

Ores.—Brown Hematite, 50 to 56 %; per ton, $1.75 @ $2.25. Red Fossiliferous, 50 @ 56 %; per ton, $1.20 @ $1.60. The above prices for ores delivered in Chattanooga on cars, or on the wharf from flat boats.

Nails.—There is no improvement to note. The demand is fair, but not pressing. The mills are now selling pretty briskly in Nashville a shade below Western Associated Mills' prices. We continue to quote at $2.25 rates; usual discount on job lots.

Manufactured Iron.—Manufacturers say this is their especial dull season, but we suppose that this season is when trade is slow, regardless of the time of year. Orders are in fair volume, business being better during the month than it was in corresponding month of 1878. We quote: Bars, 2¢; Railroad Spikes, 2.50¢; Light Rail, 2.25¢; Track Bolts, 3¢; Trestle Bolts, 4¢.

Coke.—We quote 11¢ @ 15¢ per bushel for washed foundry. Furnace full supply at $2 per ton, free on cars at Chattanooga or South Pittsburgh.

Coal.—There is no change in the market nor in prices. We quote run of mine, free on cars in Chattanooga, at $1.25 @ $1.75 ℔ ton. Lump, as per quality, 10¢ @ 12¢ ℔ bushel.

Pig Lead—4¢; Ingot Copper, 18¢.

Iron Rails.—We quote at $35 ℔ ton.

CLEVELAND.

Cleveland, April 28, 1879.

Iron Ore.—The Ore companies controlling the Bessemer qualities of Lake Superior Ore, report their products about sold up. The advance over last year's prices has been maintained in every instance. The Republic Company, which have obtained the highest prices, advertise to have sold over 100,000 tons, and do not care at present to increase their obligations for delivery of a larger amount. Among the other heavy producers, the following are virtually out of the field now, having placed all they can safely promise for the season: Lake Superior, Champion, Barnum, McComber, Michigamme, Winthrop, Salisbury, Jackson, besides all the mines of the Menominee range, including the Quinnesec, Vulcan, Cyclops, Norway, &c. The new National Mine has also sold the most of its probable product. This leaves the Cleveland and New York mines, which do not profess to yield standard Bessemer Ores, but which are in other respects of first-class quality, yet to be marketed. These companies have only lately commenced to market their Ores, and it is probable that they will have ready sale. The navigation of the lower lakes being now declared open, it is but a question of a few days when the new Ores will begin to arrive, and they come none too soon to relieve the present scarcity. For the first time in several years the railroad companies' wharves are clear of the old stocks of Ore.

Pig Iron.—There is a better inquiry for most of the grades of Pig Metal. Strong foundry Irons are in active demand, and the supply is very short. Better prices are asked and obtained. The ordinary grades of soft Iron are also more active and the bulk of business is large. Mill Irons continue dull, depressed by the low prices prevailing in all branches of manufactured Iron.

Bar Iron and Nails.—The trade is active, and there is still a large volume of business, but competition is sharp and prices reduced to a ruinously low standard.

Scrap.—All kinds of Scrap are duller, with a weakening outlook.

ST. LOUIS.

St. Louis, Mo., April 26, 1879.

Pig Iron—Is unchanged in price and movement, and the immediate future promises very little excepting a reasonably good business at about present figures. Old Rails are selling at from $20 @ $20.50. Old Wheels, $20. We quote Pig Iron:

CHARCOAL HOT BLAST.	
Missouri	$19.50 @ 21.00
Southern	18.50 @ 19.50
Hanging Rock	21.00 @ 22.00
COKE AND COAL.	
Missouri	None offering
Southern, No. 1	18.50 @ 19.50
Ohio River, No. 1	19.00 @ 21.00
Jackson County, No. 1	19.00 @ 20.00
Hocking Valley, No. 1	19.00 @ 20.00
Anthricite	20.50 @ 21.00
No. 2 and Mill $1 @ $2 per ton less.	
COLD BLAST.	
Missouri	25.00 @ 30.00
Southern	25.00 @ 30.00
Ohio	30.00 @ 32.00
IRON ORE.	
Iron Mountain	5.50 @ ....
Southwest	4.75 @ ....
Ore for fix	6.50 @ ....

BOSTON.

April 25.—*Pig* continues fairly active, and we leave our quotations unchanged. Manufactured iron is in moderate demand. Sheet Iron sell at 2⅞¢ @ 3¼¢ for Common, and Russia Sheet sells at 11¢ @ 12¢. Nails at $2.25 ℔ keg. *Copper* is steady, and we quote 16¢ @ 16½¢ for Lake. For manufactures New Sheathing at 22¢; Braziers, 24¢ @ 26¢; Yellow Metal Sheathing sells at 12½¢ @ 13¢ for English, and 14¢ @ 16¢ for American. *Lead* has again declined, and is now selling at 3⅛¢. For smaller lots, from store, we quote: Pig, 3½¢ @ 3¾¢; Sheet, 5½¢; Pipe, 5¢; Tin-Lined Pipe, 12¢; Bar Lead 6¢; all of these excepting Pig are subject to the usual trade, or 10 % discount. *Antimony* is still in light demand, but steady, and we quote 12½¢ @ 13¢. *Spelter* continues dull, being held at 5¢ for the various grades. *Tin* remains firm, and Straits in large lots can be bought for 15¢. Refined English is scarce and high. For smaller lots we quote below. We quote: Straits, 15¼¢ @ 15¾¢; Banca, 18½¢ @ 19¢; English, L. & F., 15½¢ @ 16¢. We quote Plate: Charcoal, I. C., $6.50 @ $7; Coke, $5.25 @ $5.75; and Charcoal Terne, $6 @ $7.75.—*Commercial Bulletin.*

BALTIMORE.

Mr. W. N. Wyeth, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of April 28: Trade for the past week has ruled somewhat more quiet, but values remain firm and unchanged at annexed figures:

Refined Bar Iron, 1 to 6 by ¾ to 1 ℔ lb	1.90	@ 2 ¢
" " 1 to 4½ by 1½ to 2 "	1.90	@ 2 ¢
" " ¾ to 2, Round and Square "	1.90	@ 2 ¢
Hoop Iron, 1½ wide and upward.. "	2¾	@ 2¾¢
Band Iron, from 1¼ to 4 in. wide.. "	2¾	@ 2½¢
Horse-shoe Iron "	3	@ 3½¢
Norway Nail Rods "	4¾	@ 5¾¢
Black Diamond Cast Steel "	12½	@ 13 ¢
Machinery Steel "	7	@ 8 ¢
Cast Spring Steel "	4¾	@ 5¾ ¢
Homogeneous Steel Plate "	5	@ 5½¢
Common Horse Nails "	10	@ 14 ¢
R. R. Spikes, 5½x9-16	2½¢	@ 2¾¢
Perkins' Horse shoes, ℔ keg of 100 lbs.	$3.37½	
" Mule shoes	4.37½	

	10	9	8	7	6
Putnam Horse Nails ℔ ℔	18	19	20	21	23¢
Globe Horse Nails ℔ ℔	18	19	20	21	23¢

Less list discount to the trade.

Messrs. R. C. Hoffman & Co., Iron and Commission Merchants, No. 23 South Frederick street, report the Pig Iron market as follows, under date of April 28: The Iron market remains about same as last reported. We continue last quotations:

Baltimore Charcoal Wheel Iron	$26.00 @ 28.00
Virginia " "	27.00 @ 30.00
Anthracite No. 1	19.00 @ 20.00
" No. 2	18.00 @ 19.00
" No. 3	17.00 @ 18.00
" Mottled and White	13.00 @ 14.00
Charcoal, C. B. Blooms	50.00 @ 52.00
" " Billets	52.00 @ 55.00
Refined Blooms	45.00 @ 50.00

LOUISVILLE.

Messrs. Geo. H. Hull & Co., under date of April 28, write us as follows: Pig Iron is firm in price, with a fair demand for this time of the year. Most furnaces in this section are sold largely ahead, and show no anxeity to press sales. The usual time, 4 mos., is allowed on the quotations below:

FOUNDRY IRONS.	
No. 1 Hanging Rock, Charcoal	$21.00 @ 22.00
No. 2 " "	19.00 @ 20.00
No. 1 Southern, Charcoal	19.00 @ 20.00
No. 2 " "	17.00 @ 17.50
No. 1 Hanging Rock, Stonecoal and Coke	19.50 @ 20.00
No. 2 Hanging Rock, Stonecoal and Coke	18.50 @ 19.00
No. 1 Southern, Stonecoal and Coke	19.00 @ 19.50
No. 2 " "	18.00 @ 18.50
"American Scotch"	18.00 @ 19.00
Silver Gray	17.00 @ 18.00
MILL IRONS.	
No. 1 Charcoal, Cold-short and Neut'l.	16.50 @ 18.00
No. 1 Stonecoal and Coke, Cold-short and Neutral	17.00 @ 17.50
No. 2 Stonecoal and Coke, Cold-short and Neutral	16.50 @ 17.00
No. 1 Missouri and Indiana Red-short.	20.00 @ 21.00
White and Mottled, Cold-short and Neutral	15.50 @ 16.00
CAR WHEEL AND MALLEABLE IRONS.	
Hanging, Rock, Cold-blast	30.00 @ 32.00
Alabama and Georgia, Cold-blast	28.00 @ 30.00
Kentucky, Cold-blast	27.00 @ 30.00

W. B. Belknap & Co., Iron and Steel merchants, Nos. 113 and 115 West Main street, under date of April 28, report that the jobbing trade during the past week has been marked by unusual dullness. This is largely due, doubtless, to the fact that the whole agricultural community is taking advantage of the fine weather which has been so long delayed, to put in the crops and make up for lost time. The country merchants, moreover, are disposed to do very little crediting till they can judge better of harvest prospects, the outlook for which so far is unusually promising. The rolling mills are nearly all actively employed and some of them pushed to their utmost. Prices for Merchant Iron do not yet respond to the confident predictions of a coming lockout at Pittsburgh and consequent scarcity of supply. Not a little incredulity is felt and expressed as to Pittsburgh's carrying out her programme without general co-operation on the part of Western mills, and the difficulty of obtaining this will be simply enormous. Nails are moving fairly, but there is no improvement to note in rates.

CINCINNATI.

Messrs. E. L. Harper & Co., under date of April 21, write us as follows: The demand continues very fair, and an occasional round sale keeps the aggregate movement up to satisfactory proportions. Stocks do not appear to be accumulating, and while buyers are inclined to delay purchases at full prices as long as possible, offerings below current rates usually induce purchases. We continue our quotations as follows:

HOT-BLAST FOUNDRY.	
Hanging Rock C. C., No 1	$21.00 @ 22.00
" C. C., No. 2	19.50 @ 20.00
Hanging Rock Coke and S. C., No. 1	17.50 @ 20.00
" " S. C., No. 2	15.00 @ 17.00
Virginia Coke, No. 1	19.00 @ 20.00
" No. 2	18.50 @ 19.00
Shawnee Am. Scotch, No. 1	20.00 @ ...
" S. C., No. 2	17.00 @ 18.00
Hocking Valley S. C., No. 1	19.00 @ 20.00
" S. C., No. 2	17.00 @ 17.50
FORGE IRONS.	
Hanging Rock, No. 1 C. C.	19.00 @ 19.50
Hanging Rock, No 1 Coke	17.00 @ 17.50
Longdale, No. 1 Coke	18.00 @ ....
Ala. and Tenn. No. 1 C. C.	17.50 @ 18.00
Red-short, No. 1 Coke	18.50 @ 19.50
Cold-short, No. 1	15.50 @ 16.00
Old Rails, prime, cash,	@ ....
CAR WHEEL AND MALLEABLE.	
Hanging Rock C. B.	28.00 @ 30.00
Cherokee C. B.	28.00 @ ....
Southern and Western Brands	26.00 @ 28.00

RICHMOND.

Mr. Asa Snyder, Iron Merchant and Furnace Agent, writes as follows under date of April 28: The demand for Foundry Pig Iron has fallen off, although the price remains firm; Gray Forge is in demand, and 600 tons is taken by one of our leading mills. Wrought, Scrap and Old Rails are still exciting active inquiry.

American Scotch Pig Iron	$21.50 @ 22.50
Anthracite, No. 1	20.00 @ 21.00
" No. 2	18.00 @ 19.00
" No. 3	17.00 @ 18.00
" Mottled	14.50 @ 15.50
Coke, No. 1	19.00 @ 20.00
" No. 2	18.00 @ 19.00
" No. 3	16.50 @ 17.50
Va. Cold-blast Charcoal, Cold-short	20.00 @ 23.00
Va. " " Neutral	27.00 @ 28.00
Va. Warm-blast " Cold-short	18.00 @ 21.00
Va. " " Red-short	17.00 @ 18.00
Old Rails	18.50 @ 19.50
Wrought Scrap No. 1	17.50 @ 19.00
Cast " (machinery)	15.00 @ 16.00
Richmond Refined Bar Iron	2c. @ ....
Horse Shoes per keg	... @ 4.00
Mule " "	... @ 5.00
Old Dominion Nails, Standard Size, ℔ keg	2.25 @ ....

Freights to Philadelphia, $1.40 per ton of 2240 lbs., by sail.

Freights to New York, $1.60 per ton of 2240 lbs; by sail.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(*From our Regular Correspondent.*)

London, Eng., April 14, 1879.

THE TRADE REVIVAL,

which has been and is the subject of so much public and private discussion, seems in some respects to be an established fact, although in other aspects it appears to hang fire. There can be little or no doubt that in several branches of business we are now transacting a larger turnover, but it is equally certain that in doing so we are not obtaining proportionate value for our products. At the same time it cannot be denied that the very fact of our doing an increased trade is of itself satisfactory, inasmuch as it denotes that some, at least, of the consuming markets are moving, and that it implies an upward movement in prices before long, as a consequence arising out of the circumstance itself. We are thus pleased and gratified to note the general movement toward higher values which seems to have been inaugurated on your side, because it seems but reasonable to suppose that any broad change over the vast area of your country, cannot fail to have a beneficial reflex action elsewhere. At the same time it cannot be said that there are any indications in the same direction here, but rather the contrary, inasmuch as several kinds of light hardwares have been virtually lowered in price within the past fortnight. These changes, however, may or may not be exceptional, and may be the last indications of that feebleness which has so long prevailed. It is felt, nevertheless, on all hands that any alteration in an upward direction, to be legitimate and effective, must begin at the bottom with pig and finished iron. Until these become dearer there is little or no chance of other articles realizing more satisfactory prices.

THE CLEVELAND DISCOVERY

has had one immediate effect, namely, a drop in the quotations for West Coast hematites of 2/6 @ 5/ per ton, bringing down these excellent pig irons to 50/ @ 52/6 at the works. The step shows that those who have so long ruled the Bessemer roast fully appreciate the gravity of the crisis which has come about, and that, so far as circumstances will permit, they will not allow their supremacy to pass away without a sharp contest.

THE IMPORTATION OF ORES

is also likely to be effected by the revolutionary process introduced by Bolckow, Vaughan & Co. At the present time enormous quantities of Spanish, Algerian, Elban, &c., ores are being imported into this country, as well as others of good quality from Ireland. So far as can be seen at present, these rich ores will no longer be necessary, and the large capital invested in these foreign mines will run the risk of lying dead. To those who have expended so much in the development of the mines of Bilbao and Somorrostro the news will fall with peculiar severity. They have long struggled against adverse fortune, and this new stroke will probably put an end to their sufferings.

THE GERMAN TARIFF

has at length been formulated, and shows pretty clearly that Prince Bismarck intends to obtain money without any especial regard either to native industries or to the means by which he raises it. The tax on petroleum of six marks, or $1.50, appears particularly well calculated to demonstrate the hollowness of the entire scheme, seeing that Germany does not produce a single ounce of that oil, and must perforce continue to obtain its supplies thereof from the United States. Thus, as in other cases, the unfortunate consumer will indubitably have to pay the entire duty, unless (as is probable) he elects to use less oil than he has hitherto done. The Prince, however, is desperately in earnest, and it is well known that the extreme poverty of the empire has driven him to this ridiculously absurd measure.

THE BOARD OF TRADE RETURNS

for March have been issued since the date of my last letter, and are in several senses more satisfactory than any of the recent similar statistics. The total value of our exports during the month certainly showed a diminution (from £16,756,397 to £16,170,518), but in many particulars the quantities increased, thus proving that we have begun to do a larger business, even though we have not yet been enabled to realize improved selling prices. As regards iron and steel, the statistics are decidedly more cheering, the aggregate tonnage last month being 236,141 tons, as against 188,761 tons in the same period of 1878. The pig iron shipments were much heavier, the extra sales having been for Germany and Holland, in anticipation of the incoming of the new tariff. Some little additional tonnage of this went to the United States, which also took 14,801 tons of tin plates out of the 18,693 tons placed under that head. In several other particulars there were slight augmentations, but the variations were not of high import. I think we may infer, therefore, that we have at length entered upon an era of larger sales, and that we may hope to turn over the proverbial new leaf in the course of the next few weeks. The many important and interesting items grouped under the head of "hardware and cutlery," fell off to a slight extent in the aggregate, although there were increases with individual countries, including the United States. Iron rails showed a still further diminution, whereas steel rails again increased, thus again demonstrating the decided manner in which the latter are pushing the older articles out of the market, even in the newer and non-producing countries of the world.

THE AMERICAN RAIL ORDER,

to which I alluded at some length last week, has been the subject of considerable discussion in the interval. The price at which the order has been placed is apparently not very well defined, seeing that the cablegram mentions $55, or £11, per ton at the port of destination, whereas the *Ironmonger* believes the figure is about £4. 10/ per ton, f. o. b. at Hull. The truth may really be near the latter mark, and may reconcile the apparent discrepancy between the two sets of figures. At £4. 10/, f. o. b, there would be very little more than £4. 3/ at the works, which is confessedly a lean piece of business. Even at that, however, a little profit would remain in the way I detailed last week.

THE RAIL TRADE

generally is brisk throughout the country. I am told that Wilson & Cammell's, of Dronfield, have orders on their books for over 100,000 tons, and that the quantity in the hands of Brown, Bayley & Dixon is not far from the same large figure. Charles Cammell's are rolling considerable lots at Penistone, where they have branch mills, &c., while at Barrow, Moss Bay, Bolckow-Vaughan's, Dowlais and Ebbw Vale, there is encouraging activity. Judging from what I know and hear, no more rails will be bought under £5 per ton for the next few years. The industry is certainly brisker than at any time these three or four years past.

SCOTCH PIG IRON

has been somewhat stronger, partly owing to the cessation of production brought about in the Cleveland district by reason of the Durham miners' strike. For this and other subsidiary reasons, a fair amount of business has been done. There are 240,914 tons in Connal's stores and 88 furnaces blowing, against 170,849 tons and 89 furnaces this date last year. Ballast pig is 40/ alongside ship. Writing from Glasgow on April 10, James Watson & Co. said: "Since the date of our last circular the market has improved in price, with a large business done in warrants, the strike of the Durham miners having caused buyers to come forward both here and in Middlesboro'. On Monday the market was dull, with transactions from 42/6½ to 42/5, cash; on Tuesday the price rallied from 42/5½ to 42/7½ per ton, while yesterday a very large business was done from 42/9 to 43/1, cash. To-day the advance continued, with a good business done in the forenoon from 43/3 to 43/4½, closing quieter in the afternoon at 43/2 and 43/1½ per ton, buyers remaining at the latter figure and sellers at the former. The shipments last week were 12,653 tons, as compared with 7448 tons for the corresponding week of 1878." We quote:

	No. 1.	No. 3
G. M. B., at Glasgow	43/3	41/9
Gartsherrie, "	47/3	43/6
Coltness, "	51/	44/9
Summerlee, "	46/	43/
Langloan "	49/6	43/9
Carnbroe "	44/6	43/6
Calder, at Port Dundas	47/6	43/6
Glengarnock, at Ardrossan	46/3	43/
Eglinton, "	42/6	41/6
Dalmellington, "	42/6	41/6
Shotts, at Leith	49/	44/9

THE QUARTERLY MEETINGS

of ironmasters at Middlesboro', Dudley, Wolverhampton and Birmingham have taken place without having left any notable mark. Selling prices have not been changed in any case, Staffordshire marked bars having been left at £7. 10/, with the usual 12/6 extra for the productions of Lord Dudley and Messrs. Barrows. Sheets, angles, bulbs, rivet iron, &c., were left unchanged at the quotations named in my last letter.

FROM MIDDLESBORO'

it is reported that Hopkins, Gilkes & Co. contemplate adapting their plant to steel-making, and that at the Eston Works of Bolckow, Vaughan & Co. 2000 tons of steel rails are being made weekly. The new process of the latter firm seems to have been made a decided success, and it has now been patented by the inventors, Messrs. Thomas & Gilchrist. Rails of 72 lbs. to the yard have been rolled from the steel so made, and have passed severe tests with marked success. In every respect, indeed, the novel product is said to be equal to that manufactured from hematite iron.

AT SHEFFIELD

the Easter holidays have caused but little hindrance to business, with the exception of some of the rail mills, which are now running double shifts night and day. In the steel trade proper Jessop & Sons have given their men notice of a drop of 5 %, and it is likely that other houses will follow suit. The smaller industries are fairly engaged, but there is the all-pervading complaint that profit is almost out of the question. In the electro-plate trade matters have become worse than ever, some even of the largest houses being indifferently engaged. The cutlery manufacturers are doing a fair

turnover, chiefly in best and worst qualities. Of the former a large proportion is going to the United States, especially table cutlery with Joseph Rogers & Son's brand. That noted firm sent last week no fewer than 600 dozens of one particular make of knife to your side. Good spring knives, such as Geo. Wostenholm's and Brookes & Crooke's, are also selling with moderate freedom.

THE DURHAM STRIKE

is a most serious matter for the North of England, where a number of furnaces have been damped down in consoquence of the dispute. The men censure the masters for their alleged refusal to abide by arbitration, while the employers on their side urge that they are in urgent need of the full terms of the reduction, in order that they may be enabled to keep their pits open at all. Over 30,000 miners alone are now on a strike.

STAFFORDSHIRE AND BIRMINGHAM

are quiet. To the iron trade I have already alluded. As regards hardwares and the miscellaneous products of the 'Brum district there is little news. Many of the best houses in each department are tolerably well engaged, some being quite fully employed, but in no given instance is there any real activity. Harness and saddlery are selling particularly well, while for season goods, such as toilet sets, baths, traveling trunks, &c., the sale is pretty nearly up to the average of recent times.

SOUTH WALES AND MONMOUTHSHIRE

are rather more hopeful. Last week's exports included 1150 tons of rails to Hummelvizen, and 300 tons to Gothenburg from Rhymney; 300 tons of rails for Gothenburg by the Abardare and Plymouth Co.; 966 tons of rails to Smyrna from Llynvi; 439 tons of bars to Valencia from Ebbw Vale; 110 tons bars for Malta from Dowlais; 30 tons bars to Syra and 48 tons to Smyrna from Dowlais. At Newport a vessel has been loaded with rails for Australia, and others are chartered for cargoes of the same kind for Montreal.

THE TIN PLATE MANUFACTURERS

held their quarterly meeting at Gloucester on Wednesday last, with a very full attendance. The resolution passed at the last meeting as to the size of different kinds of plates was recinded, so far as charcoals were concerned, leaving the rates then declared for cakes only. The resolution passed that in future the price quoted in Liverpool should be delivered on the quay, or alongside ship, but that all dues should be paid by the exporter, was confirmed. A hopeful view of business was taken, and most of the makers were stated to be fully supplied with orders for some time to come.

THE METAL MARKETS

have not been changed to any material extent, and there is now very little doing owing to the Easter holidays. The *Ironmonger* reports as follows: "*Copper* during the week has continued steady and firm. Good ordinary brands Chili bars are quoted at from £57. 5/ @ £57. 10/; Wallaroo, £65; Burra, £63. 10/ @ £64; English tough, £63 @ £63. 10/; selected, £64 @ £65, and strong sheets, £68. Australian remains unchanged at last week's quotations. On Thursday 410 tons of Cape ores were sold by tender at about 11/11¼ per unit for 31¼ per cent. produce. *Tin* is steady, fine foreign selling at from £69 @ £69. 5/ on the spot, and for arrival business was done at £68. 10/; English ingots have sold at £69 and £70. The imports during the week have been 1444 ingots from Brisbane and 12,697 ingots from Sydney. *Tin Plates* have not materially changed in price, although a struggle is taking place between buyers and purchasers with respect to prices, makers asserting that they will still further reduce the make rather than lower prices. The shipments from Liverpool last month were 215,970 boxes. *Lead* has been dull, at from £14. 15/ @ £14. 17/6 for English pig, and at £14. 10/ for soft Spanish, without silver. *Spelter* remains at from £15 @ £15. 5/ for ordinary brands. *Quicksilver* at £6. 2/6 per bottle, and *Antimony* at from £46. 10/ @ £47. 10/. At the fortnightly sale of *Zinc* on Thursday, 55 tons were sold at £18. 15/ per ton."

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels.)

PARIS, April 13, 1879.—*Metals.*—The weather has become stormy again and business is less brisk. *Copper* has declined 2 francs. We quote: Chili Bars, 152.50 francs the 100 kilos. for first brands, and 147.50 common ditto; Ingots and Slabs, 154; Best Selected, 157, and pure Corocoro Ore, 155. Havre is nominal; they quote first brands Chili Bars, 148.75 @ 150, and good current Urmeneta and Lota, 145 @ 147.50. Marseilles remains firm; they quote small Refined Ingots, 160; Sheathing, 190; Sheet Copper, 180; Bolts, 190, and Yellow Metal Sheathing, 175. *Tin* continues to show great steadiness. Banca has improved 2.50 francs; Straits and Australian, 5, and English, 2.50. We quote here or at Havre as follows: Banca, 195; Billiton, 192.50; Straits and Australian, 187, and English at Rouen, 180. Havre is firm, with the exception of English; the same may be said of Marseilles, where they quote as follows: Banca, 185; Straits and French, 180, and English, 182. *Lead.*—There is less doing, and a decline of 1 franc has taken place. We quote here and at Havre, 37 @ 38, and Manufactured, 46 @ 49. Havre is steady at 37 @ 38 for Soft Spanish First Fusion. Marseilles is weak and without anything doing after a decline of 1 @ 2 francs. They quote: Argentiferous, 37; First Fusion Soft, 35.50 @ 36; Second ditto, 34; Antimonious, 34, and Manufactures, 40. *Spelter.*—There is another improvement of 1 franc. We quote to-day Silesian here and at Havre, 41 @ 41.50, and Sheet Zinc, 60. Havre is steady at 41 @ 42. Marseilles has risen 2 francs. Sheet Zinc there, 54 @ 55; Old Remelted, 30. *Iron.*—Dealers in Iron at Paris willingly submit to the new conditions laid down by makers. Merchant Iron is now quoted 162 francs. Iron for flooring is still 150 francs, but with an upward tendency, and may soon be worth as much as Merchant Iron. Columns are also in demand. Heavy hardware is neglected and languishing. In the Haute Marne quite an improvement is noticeable, and with the exception of Nails and Tools, everything moves off satisfactorily. In the Ardennes there is the difficulty of too much competition, and the foundries and machine shops are not flourishing. Merchant Iron is, however, in good request there and commands 165. Heavy and light hardware are doing remarkably well. There have been received in the district some government orders for the army. The Hirson Foundry has stopped operations, while the Mahon Nail Works have resumed them. In the Meurthe and Moselle "affinage" Pig Iron has risen to 56; stocks are lighter; Common Wrought Iron as well as Tubes for water works are wanted. At the North there is an improved outlook in consequence of provincial commands. The Maubeuge meeting has fixed the price of 145 francs for Merchant Iron, equal to 140 at the works. The Rhone and Loire Region is the only one in France still as dull as ever, but they will soon have railroad orders. Merchant Iron and Steel are better. *Coal.*—Prices are still well sustained.

BELGIUM.

(Revue Universelle.)

BRUSSELS, April 13, 1879.—*Iron*—The general aspect in Belgium is by no means an encouraging one, but there is at least no further decline. The Ongree Works are now in a position to furnish the very best class of Sheet Iron for navy purposes, and the quality is pronounced fully equal to Low Moor. Our rolling mills have a fair share of orders, and the demand for Iron for architectural purposes is quite active. A good many commands have also begun to drop in from Holland, Italy and England. It is fair to presume that after a while our Iron market will lose its cheerless aspect under the impulse of this renewal of orders from various quarters, the more so as the government has thus far also assisted to its best ability, in order to relieve the situation by its railroad material purchases. The car orders are now being followed by sleeper and other orders. Rails are now engaging its attention. *Coal* is slow in reviving, but the gradually increasing activity in the Iron branch can hardly fail soon to influence Coal favorably.

GERMANY.

(Borsenhalle.)

HAMBURG, April 12, 1879.—*Metals.*—Although perhaps less active, the various metals have been well sustained at the quotations we gave last week. We quote to-day: *Copper*, at Berlin, 64 @ 68 marks for English and Australian, and 67.50 @ 68 for Refined Mansfield. Here we quote as follows: Drontheim, 69 @ 70; Quincy, 76; Lake, 85; English, 64 @ 65; ditto Sheathing, 70.50 @ 71.50; Yellow Metal ditto, 59 @ 60. *Tin.*—We quote, at Berlin: Banca, 75.50 @ 76, and English, 71 @ 72. We quote here: Banca, 76 @ 77; English, 72 @ 73; ditto Refined, 74 @ 75. *Lead.*—Berlin remains 15.25 @ 15.50. We quote here: English Pig, 15.50 @ 16; Sheet, 16 @ 16.60; German Pig, 15.50 @ 16; Spanish, 18; English and Dutch White Lead, 25 @ 29. *Spelter.*—Berlin quotes 16 @ 16.50 marks the 50 kilos.; Breslau, common brands, 14.50 @ 15.25; W. H., 15.50, and Godulla, 15.50. We quote here, spot Silesian, 17.50; to arrive, 17.50; Silesian Sheet Zinc, 22.50; Vieille Montagne, 22.50; ditto for Sheathing, 24.50; Zinc, White, 23 @ 24; Light Gray, 25.50, and Dark ditto, 29.50.

AUSTRIA.

(Austrian Trade Journal.)

VIENNA, April 11, 1879.—*Metals.*—The impulse given from abroad operates favorably also in the Austrian markets. *Copper.*—Our merchants have felt induced to increase their orders for this metal, and they seem confident that consumption will take all off their hands speedily. Old Copper and Brass are offered in smaller amounts, and it is believed that consumers will have to resort to raw Copper. *Lead.*—The advance in the value of Lead in Spain, France and England has created a better feeling in Austria, both as regards Pig Lead and manufactures, but no notable improvement in value can as yet be reported. *Spelter.*—There is increased firmness, and the metal is offered less pressingly by agents and dealers. The rise in Breslau has compelled a corresponding movement here. Speculation in metals revives.

INDUSTRIAL ITEMS.

CONNECTICUT.

A stock company has been organized at Ansonia, under the name of the National Gas Saving Company, to manufacture gas regulators under Sherman's patent. It has $35,000 cash capital. The officers are: Lewis Hotchkiss, president; E. L. Brittin, treasurer; N. Sherman, agent.

NEW YORK.

Early on Saturday of last week a fire broke out in Caldwell & Brothers' foundry, 556 West Twenty-sixth street, this city, which destroyed the building, entailing heavy loss.

PENNSYLVANIA.

The first shipment of horse shoes from the Cambria Iron Company's new horse shoe mill was made on the 1st inst., a variety of sizes being forwarded to the New York market. They are now being introduced into several of the large cities.

"Tubal Cain," in the Sharon *Herald* of the 25th ult., says: In Sharon, for the week ending April 19—At the Westerman Mill, puddle, guide, hoop and sheet mill, double turn; bar and plate mill, single turn; nail factory and spike machines on; chain factory running all its fires; blast furnace No. 2 doing very well. At Kimberly, Carnes & Co.'s mill—Puddle, guide, bar and both hoop mills, double turn; the plate mill, nail factory and puddle mill were off Saturday on account of no pig iron, but all went on again Monday. Pig iron is now coming in from the Red Jacket Furnace, in New Castle; one of the Etnas, of the same place, blowed in on Tuesday. From Sharpsville—The rumors that Sharon capitalists were figuring on the Ormsby Furnace, reported last week, have taken the shape of facts. Workmen began on Tuesday of the present week to make the necessary repairs; how much will be needed we cannot at present say. The panic struck this concern amidships, knocked a hole in it below the water line; it blowed out in the fall of 1873, and, with the exception of a short blast by Herron, Ohl & Co. in the fall of 1876 and the spring of 1877, has remained idle since that time. From West Middlesex—At the rolling mill, 10 furnaces double turn, which makes the mill on almost to its full capacity. Fanny Furnace still in blast and doing well. The work of repairing the Shenango Furnace has been stopped, with not very good prospects of being begun this summer. From New Castle—The Etna and sheet mill running full time. The Clara Furnace and one of the Etnas were waiting for the settlement of the coal strike, but owing to the scarcity of pig iron at the Kimberly Mill, in Sharon, the Etna was blown in on Brookfield coal on Tuesday.

Grove Bros. are making the final repairs to their furnace preparatory to putting it in blast, which they will do about the last of May.

The Mount Carbon rolling mill, 2 miles south of Pottsville, was burned on the 23d ult. It was owned by New York and Pottsville parties, and including machinery cost $250,000. Not insured. The mill has been idle for the past two years. The fire caught from a passing locomotive.

The cross-head of the blowing engine at the charcoal furnace of Spang, Erb & Co., at Lenhartsville, broke last Saturday, and it was at first thought the furnace would have to go out of blast, as the fire in the charcoal furnace cannot be sustained without blast as long as that in an anthracite furnace. In 24 hours, however, by rapid work the cross-head was repaired, the blowing engine was in full operation again, and the blowing out of the furnace was avoided. There is stock enough on hand to run for another year.

Mellert & Co., Reading, have received the contract for furnishing cast iron pipe for the new penitentiary, to be erected at Huntington, Pa. The amount of pipe required will be about two miles in length.

The Union Furnace in Windsor township, at the base of the Blue Mountain, which has been in operation for a period of 20 months, was stopped last week for a short time, until sufficient stock has been accumulated to enable the furnace to run without cessation during the ensuing year.

PITTSBURGH AND VICINITY.

The National Tube Works are shipping oil-well tubing to Russia.

Mackintosh, Hemphill & Co. have a contract for three blowing engines for the new blast furnaces of the Edgar Thomson Steel Company. They have also nearly completed a two-high reversing blooming mill for Shoenberger & Co.'s new steel works.

The new lap-weld pipe mill of A. M. Byers & Co. is rapidly approaching completion. The machinery is being put in position.

Some of the Pittsburgh blast furnaces experienced considerable difficulty in keeping up a supply of coke during the strike in the coke regions. There was no stoppage of the works, however, and now that the strike is broken, there will be no further trouble.

The bridge works of T. B. White & Son, of New Brighton, are being moved to Beaver Falls. The new works will be on the flat opposite the cutlery works, where much better shipping facilities are afforded than at the former site.

The axe manufactory of Hubbard, Bakewell & Co. is on full time.

Oliphant Furnace, Fayette County, which was destroyed by fire last fall, has resumed blast, making her first blast on the 14th inst.

OHIO.

The Star Glass Works at Bellaire were burned on the evening of the 24th ult. They have not been operated for three years.

The machinery at Ætna Furnace, Ironton, has been tested, and found to be in first-class order. The bottom of the furnace has been removed, and work commenced on the new hearth. Everything could be ready for blast in about thirty days.

We clip the following regarding Hanging Rock furnaces from the local press: Monroe is undergoing quite extensive repairs—a new hearth, inwalls and hot blast being put up. The Davis hot blast has been in use there, but the Player will be put in its place. She will not be ready to go in blast till some time in June. Madison is making some slight repairs, and will go into blast as soon as sufficient charcoal can be burned. She has between 5000 and 6000 tons of ore on hand. All of the Jackson stonecoal furnaces are idle, excepting Fulton. She has been very much improved by a new hearth and inwall. She also enlarged her bosh from 10 feet 6 inches to 13 feet 6 inches, and also enlarged her stack at the top and placed her bell under, instead of over, as heretofore. The results of the change are about 16 tons of iron per day instead of 10, and of much better quality. Tropic Furnace will probably be forced to sale. By deaths and other causes her ownership has so largely fallen into the hands of minors and others, not able to add means to start her up, that some such step will have to be taken before anything can be done with her. Milton Furnace at Wellston, if not now out of blast, will very soon be compelled to shut down on account of her hearth being worn out.

Up to Saturday the 19th of April, 330,436 kegs of nails had been received at Cincinnati since September 1, as against 284,991 for the same time last year.

The sale of the Steubenville Furnace property has been set aside by the court, and the property will be re-advertised for sale.

The old Irondale Furnace mill and coal property is for sale.

A new company has been organized, and has leased the Gaylord Rolling Mill, Portsmouth, for 10 years. The make up of the new company is very good, comprising several solid and successful business men. Mr. J. C. Lewis, of Pittsburgh, formerly of the firm of Lewis, Dalzell & Co., is to be the general superintendent.

The Wages Conflict in England.—Wages reductions are still the order of the day, and are threatened in the Sheffield steel trade, Messrs. Jessop & Co. having given notice of a reduction of 5 per cent. in wages and a lengthening of the working day by half an hour. Wages are falling with prices all over the country, the men yielding as a rule, but resisting in some cases. A great conflict is going on in the coal trade of Durham, more than 30,000 miners having struck against a further reduction of 15 per cent. wages. During the last five years the wages of the Durham miners have been lowered 58 per cent., so that if the present reduction is ultimately enforced, they will receive only one-fourth the amount paid in 1874. Under such circumstances it is not surprising that the miners should strike in sheer desperation. Unfortunately they are also resorting to violence, after having offered to submit to a reduction of 7½ per cent. or abide the result of arbitration, both of which the employers peremptorily refuse.—*Sheffield Independent.*

The Oldest Mine Map.—Dr. Gurlt, a German metallurgist who has devoted much attention to the study of the history of mining and metallurgy, exhibited recently, before a German society, a copy of what appears to be the oldest map of a mine known. It is the plan of an Egyptian gold mine from the time of King Seti I, or about 1400 B. C. The original, drawn on papyrus, is at the museum of Turin, Italy.

Two eminent Germans, Prof. Dore, a leading physicist and meteorologist, and Prof. Karmarsch, an acknowledged authority on technical subjects, late director of the Polytechnic School at Hanover, died recently.

East Palestine, Ohio, writes on the 22d: The State Line Coal Works is running to its full capacity, employing upward of 400 men. The Prospect Hill mines are starting up for a steady spring run, having in now about 40 men.

FAMILY GRINDSTONE.

After much experimenting, we have now fully perfected our GRINDSTONE for family use, and offer it to the public with a FULL GUARANTEE that it is a perfect machine; and also that it will please every one who buys it. So far as we know, it is the first Foot-Power Machine which has been fully adapted to the wants of families for household work and of mechanics for grinding small tools. The stone is of the best quality, and runs perfectly true. It is 8 inches in diameter, 1½ inches thick, and made at the Huron Quarries expressly for this use.

The EMERY WHEEL is the same size as the Stone, and double coated on the side and rim with best Wellington Mills Emery. When not in use, it is taken off and laid aside. A sponge is fastened in the side of the trough, to keep the Stone from throwing water when running at a high speed.

The Machine is run with a clutch, so that there can be no dead centers; but when the foot touches the treadle it starts off in the right direction, and runs at a very high or very low rate of speed, as desired. For grinding Carving Knives and all light tools, and for polishing Cutlery, this Machine is perfect. The legs are made to fold up for shipping, so as to occupy a small space. Weight, 26 pounds. Price, including box, $3. It is for sale in MOST HARDWARE STORES in the country at our price, with a reasonable amount added for freight.

MILLERS FALLS CO.,

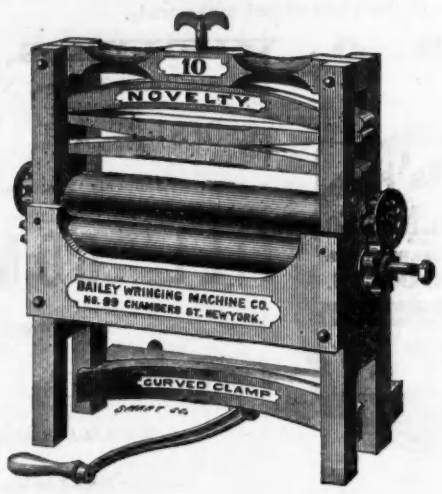
74 Chambers Street, New York.

BAILEY WRINGING MACHINE CO.,

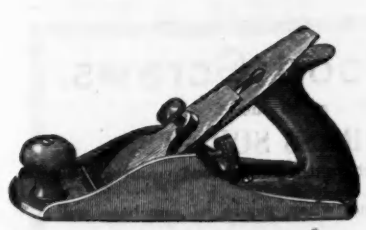
No. 99 Chambers Street, New York.

MANUFACTURERS OF

Novelty and Excelsior Clothes Wringers. Novelty and Excelsior Carpet Sweepers.



Defiance Metallic Planes, Spoke Shaves, Try Squares, Box Scrapers, &c., &c.



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Send for Illustrated Price List and Discount Sheet.

TRAVIS'

Automatic Self-Adjusting Iron Railway Cross-Tie.

These Cross-Ties have been in use since September 9, 1878, in a severe curve on the Philadelphia and Baltimore Central Railroad, with the most satisfactory results. The main features of this sleeper are:

1. It will save about one-half the labor.
2. It does away with all spikes, bolts, fish-plates, or joint straps.
3. It dispenses with drilling Bessemer steel rails, as every hole drilled is acknowledged to be an incipient fracture to the rail.
4. It will outwear twelve renewals of ordinary wood sleepers.
5. It has proved the most elastic sleeper in use, during all seasons.
6. It insures smooth and easy riding, with minimum wear and tear.
7. It was particularly noticed that it did not heave with the frost, while the wood ties that formed the connection with the iron ties, were heaved from 1½ to 2 inches.
8. It will be seen that the more weight upon the rail the firmer it is held, with no possible chance of accident by the rails spreading.
9. It is a noticeable feature that the noise is much less, it being deadened by the elastic blocks which support the clamps.

For further information address

THOMAS W. TRAVIS,

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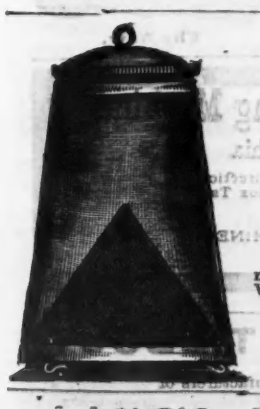

TRADE MARK.

The "Paragon" Trap is equal to any in the market. Made of best materials by good workmen. We guarantee each Trap to be perfect. We solicit a sample order.

LOWEST PRICES QUOTED JOBBERS ON APPLICATION.

BROMWELL MFG. CO.,

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LANE'S MEASURING FAUCET.

Price, $3.00.

For Light or Heavy Molasses, Oils, Varnishes or other Fluids.

We warrant these Faucets to be as represented, measuring correctly and working more easily in heavy molasses than any Measuring Faucet in the market. No grocer can afford to be without them, for they save time, and "time is money." They insure perfect cleanliness, requiring no tin measures or funnel to collect dirt and draw flies. They do not drip. They prevent all waste, as no molasses or other fluid can pass except when the crank is turned. They are the embodiment of simplicity, and consequently they are always in order. They work easily in the heaviest molasses. They are warranted to measure correctly, according to U. S. Standard.

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NATIONAL Horse Nail Co.

MANUFACTURERS OF

FINISHED

(BRIGHT OR BLUED)

These nails are made of the best brands of NORWAY IRON, and are guaranteed to be equal to any in the market.

NATIONAL HORSE NAIL CO.,

VERGENNES, VT.

HORACE DURRIE & CO., Agents,

No. 97 Chambers St., New York

ANVIL NAIL CO.

We desire to call the attention of the trade to our new manufacture of

Steel Horse Shoe Nails,

made from metal prepared in the Martin-Siemens Furnace by our PATENT process, which produces a nail having all the requisites for a

PERFECT HORSE SHOE NAIL.

The well-known desirable properties of a perfect nail are, that the POINT should be sharp, the SHANK stiff, to drive without crippling under the hammer, SOFT enough to clinch readily, while sufficiently tough to avoid all danger from the "drawing the clinch" or breaking the neck under the head. These properties we claim for the

"ANVIL HORSE NAILS."

In the process of manufacture the metal is compressed under the head, which gives the nail great strength where it is required (between the shoe and hoof), and the cold rolling gives it a stiffness attained in no other way, while the quality of the metal used insures a clinch and point unsurpassed by any nail ever offered in the market.

Samples and prices sent on application.

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65, 67 and 69 Washington St., New York.

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East Haverhill, - New Hampshire,

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STONES.

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Genuine OLD RELIABLE,
INDIAN POND (Red Ends),
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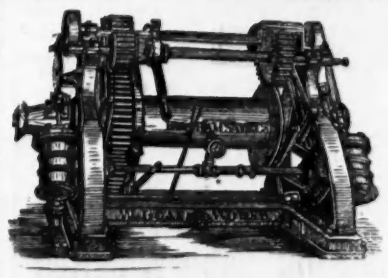
Stones gotten up and labeled in any style desired.

PRICE and QUALITY GUARANTEED.

All the above Stones are of good keen grit and *will not glaze.*



The "Ramsay Improved Steam Winder,"

Manufactured by *H. A. RAMSAY & CO.,*

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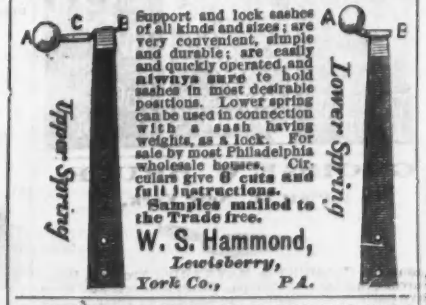

Support and lock sashes of all kinds and sizes; are very convenient, simple and durable; are easily and quickly operated, and **always sure** to hold sashes in most desirable positions. Lower spring can be used in connection with a sash having weights, as a lock. For sale by most Philadelphia wholesale houses. Circulars give 6 cuts and full instructions.

Samples mailed to the Trade free.

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BOILERS, ENGINES AND TANKS FOR SALE at LESLIE BOILER WORKS Pearl, near Greene St., Jersey City. Repairs promptly attended.

Established in 1839. Formerly L. & A. G. Coes.

L. COES & CO.

Manufacturers of L. Coes'

GENUINE IMPROVED  AND MECHANICS

Wide Bar Full Length. Wide Bar Full Length.

Patent Screw Wrenches

UNDER PATENTS DATED

JUNE 26, 1866,
MARCH 23, 1869,
REISSUED 1870.

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REISSUED JUNE 1, 1869,
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The back thrust when in use borne by the SHANK instead of the Handle.

None genuine unless stamped "L. COES & CO."

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HORACE DURRIE & CO., Sole Agents.

These Axes Made from

HORACE DURRIE & CO., Agents, - New York.

Firth's Best English Cast Steel.

The 1879 Pennsylvania Lawn Mower.

LIGHT DRAFT AND EASILY ADJUSTED.

Every Machine Warranted to Work as Represented.

Points Claimed as being Meritorious:

1. Lightness, combined with Strength in Construction.
2. Easiness of Adjustment.
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6. The Attractive Appearance of the Machine.

It is the lightest machine in use, and all that necessary to satisfy our customers of its superiority is to place it in competition with *any other machine* in the town in which they may reside.

PRICE LIST.

Width of Cutter.	Style. Driving Wheels.	Power required.	Weight.	Price
10 inch.	8 inch.	A Child.	30¾ lbs.	$14.00
12 "	8 "	A Lad.	33½ "	18.00
14 "	8 "	A Lady.	36 "	20.00
16 "	8 "	One Man Size.	38 "	22.00
18 "	8 "	" "	41 "	24.00

NEW MACHINES.

15 inch, 10½ inch Driving Wheels, 6½ inch Cylinder, Man Size, 48 lbs. $22.00
17 inch, 10½ inch Driving Wheels, 6½ inch Cylinder, Man Size, 51 lbs. 24.00

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Bit Braces,

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Comprising every grade of quality and finish, from the cheapest Farmers' Brace to the finest Steel Sweep, heavily nickel plated, with rose-wood handles and lignum vitæ heads, being the most complete line offered by any manufacturer in the country, and which for simplicity of construction and effectiveness have no equal. Catalogues and price lists furnished upon application at office and salesroom,

No. 102 Chambers Street, NEW YORK.

The Treatment of Iron Surfaces by the Barff Process.

The reference to the Barff and other processes for the treatment of cast-iron surfaces, in the address of Mr. Bayles, before the National Association of Stove Manufacturers at Rochester last winter, on "Taste and Art in Stove Ornamentation," have attracted much attention among stove founders, and brought us a great deal of correspondence, mostly letters of inquiry, asking for details of the apparatus employed. For this reason we give place to an abstract of a paper lately read by Prof. Barff before the Society of Arts, in which some information is given additional to that already published. It will be remembered that the Barff process consists in producing a skin of black magnetic oxide on the surface of the iron, by submitting it to the action of superheated steam in a tight chamber of special construction.

No one, says Prof. Barff, who has a right knowledge of the properties of magnetic oxide of iron formed on the surface of the iron by the action of the superheated steam, could doubt its power to resist atmospheric influences, and even the action of sea water; but the doubt that did exist in the minds of many was whether it could be produced artificially on iron, so as to keep its place and enable the iron beneath it to resist their action as well; or, rather, I should say, whether its adherence to the iron was so complete and perfect as to protect it from them. It has been objected that the process might be of use for small articles, pots, pans, &c., but that it could not be applied to large articles, and, even if it could, it would so materially weaken the iron that dependence could not be placed on its strength; in fact, if I remember rightly, a solemn warning was given to persons not to trust to it. Now, that the process is only applicable to pots, pans, &c., the articles before you will disprove. A year and a half ago I had a chamber built of fire-brick, and that has been in use ever since. In it articles 6 feet long have been treated; and if the chamber were 12 feet long, or 20, articles of such lengths could be treated as well as those which you see before you. As to the action on the strength of the iron, bars treated have been tested for breaking and tensile strain, and the result is that the strength of the iron is not affected, and the persons who tested them assert that they would not hesitate to use the process because of any injurious effect which it has on the strength of iron.

In the earlier experiments performed at my laboratory at Kilburn, it was often found that the coating of black oxide scaled off wrought-iron articles. This is never the case now. This scaling resulted from an insufficient and irregular supply of steam to the muffle during the operation, whereby air was not excluded, but was often forced in from the want of a sufficient pressure of water on the superheating pipes. Air must be completely excluded from the oxidizing chamber, because, if the oxidation of the iron depend, during any part of the process, on the oxygen in the air, such oxide formed will not adhere to the iron properly. This I have proved by submitting iron to oxidation by dry air, and in every case wrought iron has, when so treated, lost its coating, which has flaked off in scales; and in the case of cast iron, the oxide on exposure comes off in a very short time, and, therefore, does not provide perfect protection to the iron. If, however, the air forced into the chamber be moist, the same result occurs with wrought iron, but with cast iron the coating formed does adhere for a time, and the length of its adherence is proportionate to the quantity of moisture present in the air. If the air be forced into the ordinary chamber from a vessel in which it is in contact with water, and if the temperature of the room in which this vessel is be high, as in such case it must be, the quantity of moisture converted into steam, when at the temperature of the iron to be oxidized, will be great, in fact, enough to oxidize the iron, for very little steam is required to oxidize a great weight of iron; but then the oxygen of the air will take part in the action, and wherever the iron is oxidized by the oxygen of the air its adherence will not be complete, and though by being mingled with the other oxide it may have a certain amount of stability, yet in a short time it will come off. I exhibit two specimens in illustration of this, one of cast, the other of wrought iron, both of which have been exposed in the open for some time; the piece of cast iron did not rust for some time after it was exposed, but the wrought iron flaked and rusted at once. It appears, therefore, to be absolutely necessary, to secure a good result, that air must be completly excluded from the oxidizing chamber.*

For a long time I experienced considerable trouble from the appearance of small spots of rust on articles otherwise well coated, which were immersed in water. The spots of rust appeared to increase in size, but on examination it was found, after washing off the rust, which could be easily removed, that it originated from small openings in the coating of black oxide. It required a magnifying glass to see these openings; the rust did not spread by more of the iron surface rusting, but because the rust formed in these minute cracks was carried out by the water in which the articles were, and was therefore diffused about. Such rusting has no effect on the strength of the iron, and after a few cleanings it ceases altogether. However, I felt that it was very necessary to prevent it, and that led me to seek carefully for its cause. When iron is heated it expands; when cooled, it contracts. If iron be heated in an oxidizing chamber it expands; its pores, so to speak, open. If a jet of superheated steam be admitted at a temperature lower than that of the iron in the chamber, the iron will contract, and then will decompose the steam; of course it must be at a sufficiently high temperature to do so. Now, the iron will gradually get hotter, and will expand again, and the first thin coating of black oxide will be in part cracked, and as the oxide goes on forming it will in part cover and fill up these cracks, but I think—in fact, I am sure—that it does not do so perfectly, and hence some of them remain, the iron at the bottom of them being coated with but a very thin film of oxide. Reasoning in this way, I came to the conclusion that no contraction must be allowed to take place in the iron after the oxidizing action had commenced, and to secure this the ordinary chamber is always kept at a much lower temperature than the superheater; and now it is never allowed to rise above 500° or 600° F. before the superheated steam is admitted, and the steam is never allowed to pass in at a temperature less than 1000 degrees. This for a long time has been our invariable plan of work, and in no case whatever have we experienced any failure as long as the apparatus was sound.

It has always been my opinion that the best way of forming the black oxide on iron is to conduct the process by means of superheated steam alone, because the steam, being the source of heat to the iron, raises its temperature to that at which it can decompose steam, so that oxidation commences immediately the iron is hot enough. When the iron is heated in the chamber, before the steam is allowed to act upon it, there is always danger of air getting into the chamber and forming a film of oxide before the steam gets to work, and this is a thing to be avoided. I have only been able to experiment with superheated steam alone on a small scale, and the large chamber has flues up its side which would conduct off the heat if it were attempted to raise its temperature by superheated steam alone. I may be here misunderstood. The flues at the sides of the chamber would cause cold air to circulate round it, and the heat from the superheated steam would thus be conveyed away. The experiment I did perform was with an iron muffle, similar to that which was used in the early experiments. This was surrounded with fire-clay, to act as a non-conductor of heat. Steam, at 1500° F., was interjected into it for a short time, and then the articles to be treated were put inside it, and the steam was again let in. In a short time the muffle and its contents became red hot, and, after a few hours, were found to be well coated with black oxide. This artificially formed black oxide gives great hardness to the surface of the iron when the coating is sufficiently thick, when it is even less than one-sixteenth of an inch. It will for a long time resist a rasp and will remove pieces of steel from it. Substances which adhere to iron, zinc and enamel, will not adhere to it. I had water evaporated in an oxidized pan for six weeks; the water never boiled, but was slowly evaporated. The deposit was removed with a duster; it did not stick to the iron. This is a matter of great importance to boilers, and for pipes through which water is to be conveyed.

Now, articles coated can be submitted to a high temperature, even a red heat, without the coating being injured or disturbed. At present I fear that iron wire cannot be treated successfully; the wire can be treated and will not rust, but it cannot be bent to a sharp curve without the coating coming off. I show a specimen to prove that the wire, when not bent, does not rust, and that articles made of wire can be made non-rustable provided they are not stretched beyond a certain point. Riveted iron plates can be most successfully treated; the process tightens the rivets and assists the calking; the plates before you show this. I have not solved the question of riveting plates after treatment, but I am sanguine that I shall be able to do so. Weights are treated for the government, and submitted by Mr. Chaney to tests, and the process is now recommended by that department for the standard weights throughout the country. I also exhibit two specimens, one of oxidized and the other of common iron, on which gold leaf has been put in the ordinary way, with oil gold size, and I think they illustrate well that even where it is desired to paint or gild iron to be placed in exposed situations, it is very desirable to have it first treated by my process; both the specimens have been out of doors for two months, exposed to rain and snow; for some days they were completely buried in snow.

I regret to say, gentlemen, that I cannot speak very definitely as to the cost of the process. I do not wish to delude any one by a statement that it can be done for so much per ton. It is simply impossible to do this, as you will see. Hollow goods, such as saucepans, &c., will take up a much larger space per ton than a ton of 56-pound weights, and this shows how fallacious any general statement on this head must be. My experiments have not been conducted with special regard to economy, but to efficiency, and having settled this point, economy must now be inquired into. This is rather the work of the manufacturer than mine; but this much I can say for your guidance, that, even with my means, the cost for light articles does not exceed that of galvanizing. My experience tells me that different kinds of cast iron behave differently under treatment. Some kinds require longer exposure to the action of the superheated steam than others. Why this is I cannot as yet find out.

I have not yet met with any sample of cast iron which could not be properly treated. Wrought iron requires a somewhat different treatment. A lower temperature (about 900° F.) suits it best, and steel also. It is not well to expose articles very different in bulk at the same time. All that are put into the muffle should be pretty nearly equal in bulk. I mean that very heavy articles, such as 56-pound weights, should not be treated with, say, gutter spouts. Cast and wrought iron should not be treated together; but all these are matters which a little experience will regulate perfectly. Sometimes the sand from the mold adheres to cast iron. This is often the case inside pipes. It is of no moment, for the sand itself gets so firmly fixed on the coating of black oxide that it assists in protecting the iron I have proved this by severe experiments. In clearing off the rust from iron before it is submitted to the action of superheated steam, the usual method is employed. It is immersed in dilute oil of vitriol, and after washing, is put into some bran water. This last operation is to remove any basic sulphate of iron from the surface. If this basic sulphate is not completely taken away when the iron is heated, it is reduced, and red oxide of iron is left on the surface, which has the color of the red oxide used for paints, and you will see some articles so colored before you. This red oxide does not prevent the formation of the black oxide beneath it, and does not interfere with its stability. It is, therefore, of no importance, except to the appearance of the articles.

An important point which was touched upon by several of those who had been testing Prof. Barff's process, was that the articles so coated, though they resisted abrasion very well, were deprived easily of their coating by a few knocks with a hammer, a fact which Prof. Barff himself admitted in the discussion following the reading of the paper. Another important point admitted as well, is that, although steel can be treated equally well with iron, it loses its temper. Trials to retemper it have not yet been made.

* This claim is contradicted, at least as regards cast iron, by Mr. George Bower, who states that he has succeeded in regularly coating cast iron at a cost of £2 per ton.—*Ed. M. W.*

Mr. Vanderbilt's English Rails.—The *Ironmonger* gives the following particulars concerning the English rails ordered by Mr. Vanderbilt: The rails are understood to be 56 pounds per yard flange rails, and it is stated that they are to be shipped to San Francisco for use in California. The order was not placed in the open market for competition, but was privately entrusted to the two English houses which will manufacture the rails. The contract has been secured by Charles Cammell & Co. (Limited), Cyclops Works, Sheffield, and by Messrs. Wilson, Cammell & Co., the Bessemer Steel Rail Mills, Dronfield, near Sheffield, who will jointly complete it. There appears to be some little confusion on the subject of the price to be paid, seeing that the *Times* message gives £55, or £11 per ton, whereas our information leads us to believe that the figure will leave the manufacturers about £4. 10/ per ton f. o. b. at Hull. The latter is probably nearer the truth, but we cannot absolutely guarantee the accuracy of the net price named.

COLEMAN EAGLE BOLT WORKS

ESTABLISHED 1845.

WELSH & LEA.

NORWAY IRON CARRIAGE & TIRE BOLTS,

AXLE CLIPS, &c.

Highest and only Awards and Medals, Philadelphia, 1876, and Paris, 1878.

WORKS, Columbia Avenue, Hancock and Mascher Streets.

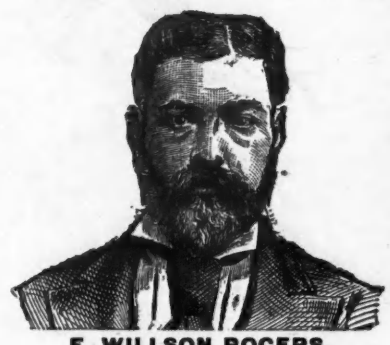
OFFICE, 145 Columbia Avenue (late 2030 Arch St.)

PHILADELPHIA, U. S. A.

ROGERS CUTLERY COMPANY, Hartford, Conn.

WM. ROGERS,
Senior Member and Manager of the Firm of ROGERS BROTHERS. Died Feb. 17, 1873.

ASA H. ROGERS,
Of the original ROGERS BROTHERS, and half owner of the Rogers Cutlery Co., when organized. Died Oct. 4, 1876.



F. WILLSON ROGERS,
Son of the late Wm. Rogers, and Secretary of the ROGERS CUTLERY CO.

1871 ROGERS CO. HARTFORD, CONN. 12

Our Knives stamped as above we guarantee

To Strip 12 dwts. of Silver per dozen.

Our Knives are guaranteed to be

ALL HAND BURNISHED,

and are put up in rack boxes with hinge covers.

We guarantee Spoons, Forks, &c. to be plated on

18 PER CENT. NICKEL SILVER, AS FOLLOWS:

On Tea Spoons,	2½	ounces,	or 50	dwts. per gross.
On Dessert Spoons,	3½	"	" 75	" "
On Table Spoons,	5	"	"100	" "
On Dessert Forks,	3½	"	" 75	" "
On Medium Forks,	5	"	"100	" "

OUR SPOONS, FORKS, LADLES, &c. ARE STAMPED

On Extra Plate,	1871, ROGERS	5 oz.
On Double Plate,	1871, ROGERS	8 oz.
On Triple Plate,	1871, ROGERS	12 oz.
On Quadruple Plate,	1871, ROGERS	16 oz.

1871 ROGERS CO. HARTFORD, CONN. 24

All Hollow Ware stamped as above is warranted to be plated

50 PER CENT. HEAVIER

than any other brand of goods.
Our Hollow Ware in addition to our trade mark is stamped

SEXTUPLE PLATE,

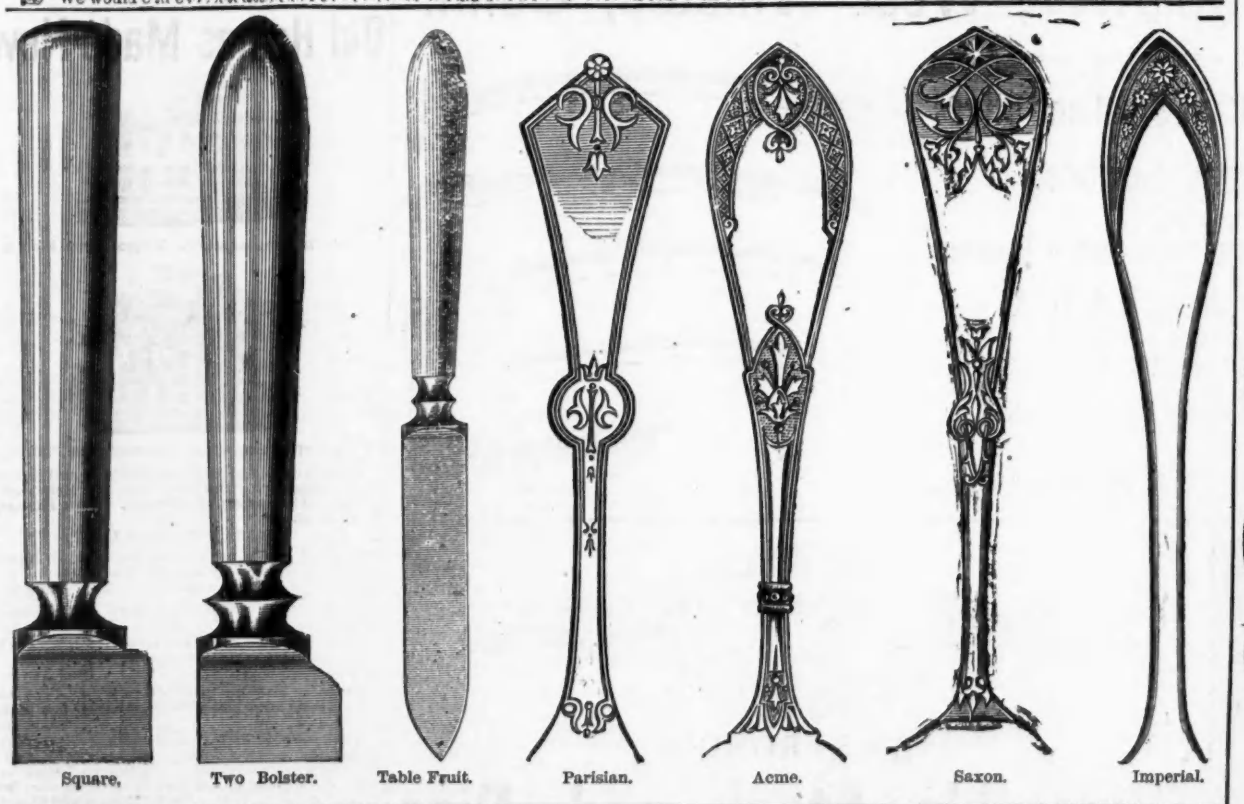
we being the only firm who manufacture this weight of plate.

WE GUARANTEE our Spoons, Forks, &c. to be Plated 25 Per Cent. HEAVIER THAN STANDARD PLATE.

☞ THE ABOVE IS A FAC-SIMILE OF OUR GUARANTEE CARD WHICH ACCOMPANIES EACH DOZEN OF OUR FLAT WARE, AND EACH PIECE OF OUR HOLLOW WARE.

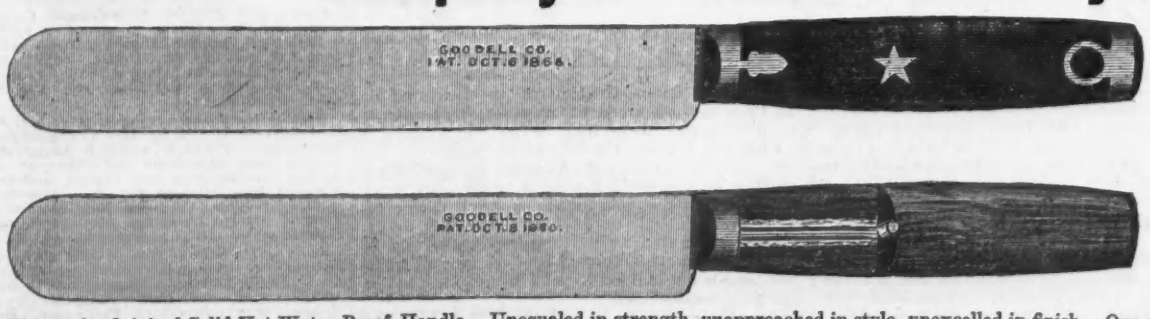
Our goods have been in the market since 1871, and are acknowledged by all dealers, who have tried them, to be THE BEST.

☞ We would call especial attention to the SEMI-STRONG SPRING TEMPERED SHANK, which we have on our Tipped, Fiddle, Saxon and Imperial patterns



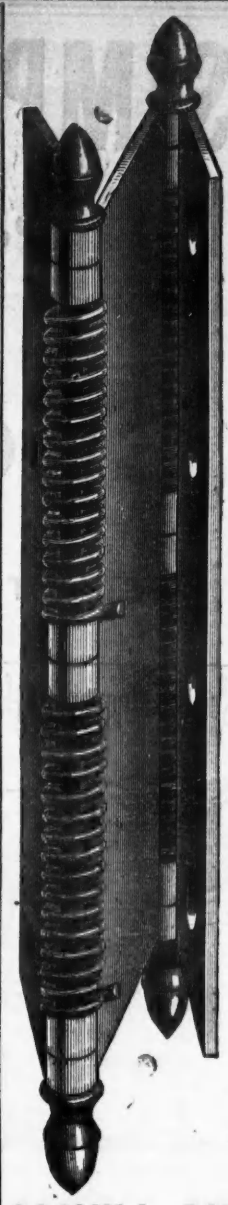
Square. Two Bolster. Table Fruit. Parisian. Acme. Saxon. Imperial.

Goodell Company's Table Cutlery.



This is the Original Solid Hot Water Proof Handle. Unequaled in strength, unapproached in style, unexcelled in finish. Our new styles are exceedingly popular, and for weeks we could not supply the demand. With additional machinery we have largely increased our production, and can now fill orders promptly, and respectfully solicit the public patronage.

GOODELL COMPANY, Sole Manufacturers,
Antrim, N. H.



SPRING HINGES

WITH

Patent Anti-Friction Springs,

FOR

SCREEN DOORS.

PRICE LIST.—Per Dozen Pairs.

SINGLE JOINT HINGES.

(To Swing one way.)

SIZE.	WITHOUT ACORN TIPS.		WITH ACORN TIPS.	
	BRASS.	NICKEL PLATED.	BRASS.	NICKEL PLATED.
2⅜ inch.....	$ 3 00	$ 4 50	$ 5 00	$ 6 50
3 "	4 50	6 50	6 75	8 75
5 "	7 50	10 00	10 00	12 50

DOUBLE JOINT HINGES.

(To Swing both ways.)

To be used on Door 1 inch thick, or less.

SIZE.	WITHOUT ACORN TIPS.		WITH ACORN TIPS.	
	BRASS.	NICKEL PLATED.	BRASS.	NICKEL PLATED.
2⅜ inch.....	$ 6 60	$ 9 00	$11 50	$14 25
3 "	8 30	11 50	13 50	17 00
5 "	16 50	21 00	21 50	26 00

The large cut represents full size of our 5-inch Double Joint Acorn Tip Hinge for mortising.

The small cut represents the plain Single Joint Hinges, but not full size.

Sample pair will be sent by mail on receipt of price.

Liberal Discount to the Trade.

SCOVILL MFG. CO., Nos. 419 & 421 Broome Street, NEW YORK.

HAMMER & CO.,

Branford, Conn.,

Manufacturers of the following *Patented* Articles of

MALLEABLE IRON:

Hammer's Adjustable Clamps.
Hammer's Malleable Iron Oilers.
Hammer's Mall. Iron Hand Lamps.
Hammer's M. I. Hanging Lamps.

For Sale by all the principal Hardware Dealers

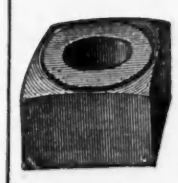
Malleable Iron Castings

Of superior Quality and Hardware Specialties in Malleable Iron made to order.

STANDARD NUT CO.,

Pittsburgh, Pa.,

MANUFACTURERS OF



HOT PRESSED

Square & Hexagon Nuts,

HENRY B. NEWHALL 11 WARREN ST. N NEW YORK AGENT

R. R. FISH BARS,

BOLTS,

SPIKES,

RIVETS, &c.

Wheeler, Madden & Clemson

MFG. CO.,

MIDDLETOWN, - - - - NEW YORK.

Manufacturers of

WARRANTED CAST STEEL

SAWS

Of every description, including

Circular, Shingle, Cross-Cut, Mill, Hand,

WOOD SAWS, Etc., Etc.

AMERICAN SAW CO.,

Manufacturers of

Movable Toothed Circular Saws,

PERFORATED CROSS-CUT SAWS

And SOLID SAWS of all kinds. Trenton, N. J.

The Iron Age Directory

and Index to Advertisements.

SPECIALTIES IN CARRIAGE HARDWARE FORGINGS

MANUFACTURED BY

WILCOX & HOWE,

BIRMINGHAM, CONN.

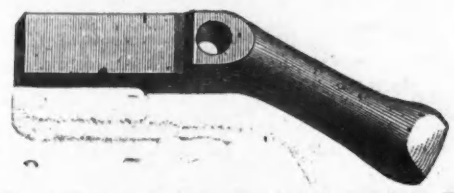
No. 3, STAY-END.

Made under letters patent of Oct. 22, 1873 and Dec. 21, 1874. Four sizes: ⅜, 7-16 ½ and 9-16 in. Two dozen in a box.

STRAIGHT STAY-END TIE.

Made for ⅜, 7-16, ½ and 9-16 in. Stays, from best Norway Iron. The shape is such that it can be used with Round or Oval Stays. The back hole can be drilled to fit any size of axle. Two dozen in a box.

BENT STAY-END TIE.

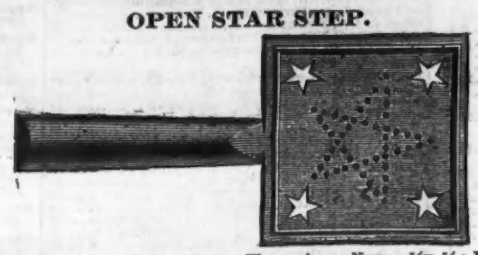


Made for ⅜, 7-16, ½ and 9-16 in. Stays, from best Norway Iron. The shape is such that it can be used with Round or Oval Stays. The back hole can be drilled to fit any size of axle. Two dozen in a box.

No. 4, NEW STAY-END.

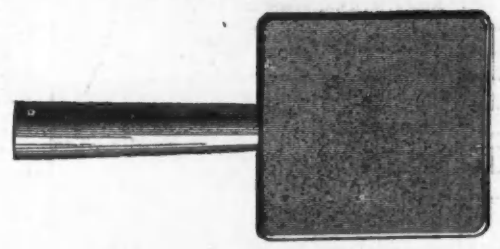
Made from best Norway Iron, under letters patent of Sept. 1, 1874. Desirable for plain work. Four sizes. Two dozen in a box.

OPEN STAR STEP.



Forged from best Norway Iron. Three sizes: No. 1, 3¼x3¼; No. 2, 3⅝x3¾; No. 3, 4x4¼ in. Made under patent of April 11, 1876. Also made without open stars in corners.

PLAIN STEP.



Made from best Refined Iron. The cheapest and best Plain Step made. Three sizes: 3x3⅛, 3⅝x4, and 4x4¾ in.

SHORT JOINT EYES.

Round or Oval, ⅜ to 9-16 in. hole for prop. Four dozen in a box.

LONG JOINT EYES.

Sold in sets. Round Joint Eyes are made from 7-16 and ½ in. iron. Oval Joint Eyes from ½, 9-16, ⅝, ¾ in. iron. Size of hole for prop, ⅜ to 9-16 inch. In ordering, state what prop you use.

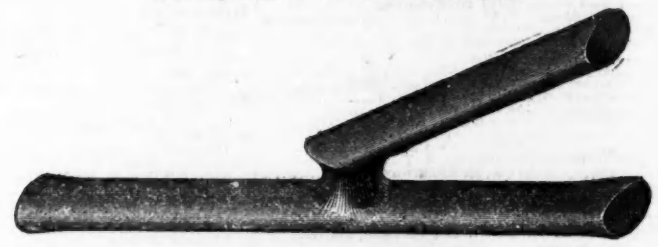
No. 1, STAY-END.

Made from one piece of best Norway Iron, under letters patent of Oct. 22, 1873, and Dec. 21, 1875. Two sizes: ⅜ and 7-16, and ½ in. Two dozen in a box.

No. 2, OFFSET.

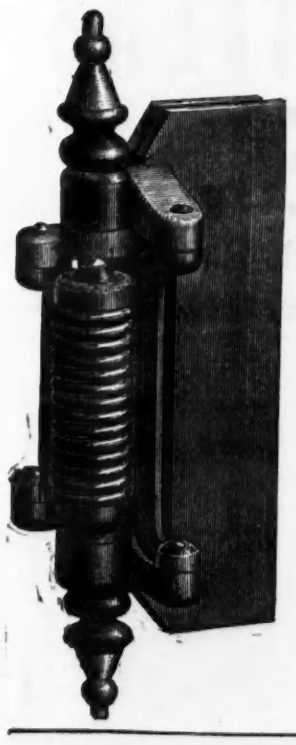
Forged from one piece of Norway Iron. Made under patents of Oct. 22, 1873, and Dec. 21, 1875. Four sizes: ⅜, 7-16, ½ and 9-16 in. Two dozen in a box.

No. 7, NEW OVAL OFFSET.



Made from best Norway Iron, under letters patent of Sept. 1, 1874. Five sizes 9-16x⅜, ⅝x⅜, ¾x7-16, ⅞x½ and 1x⅝ in. Two dozen in a box.

Send for our Illustrated Catalogue of 1878; the most complete Catalogue of Forged Carriage Irons yet published. All goods of our manufacture are fully warranted.



THE COWLES HARDWARE CO.,

Unionville, Conn., U. S. A.,

MANUFACTURERS OF

Geer's Single and Double Acting Spring Butts.

THE LATEST AND BEST.

Investigate Before You Purchase.

Large Quantities already in Use and giving Universal Satisfaction.

Read the following Points of Superiority:

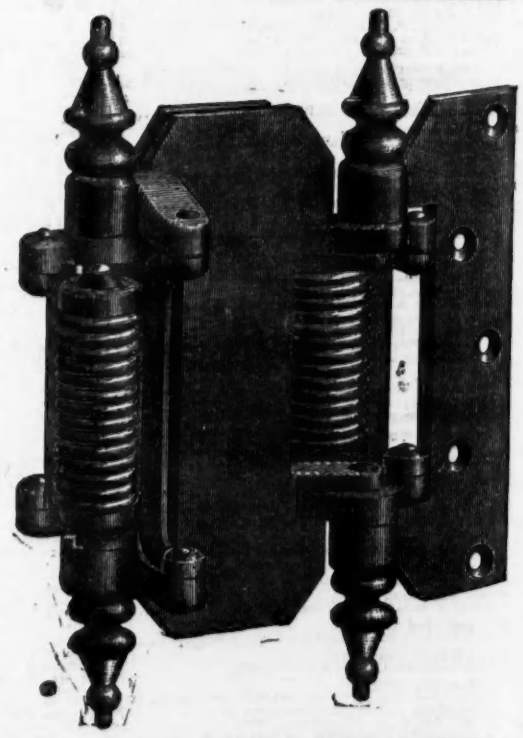
These Spring Butts differ in principle from all others, having a **Spiral Spring** for **power,** and *Toggles* for **Levers** in *combination,* and when applied to the leaves of the Butts, **exert their greatest power** when the **door is closed,** and are the **only Butts** in existence that will by **actual test** perform the labor claimed for them.

They offer **less resistance** the wider the door is opened, until a point past the right angle is reached, where the **power** is **reversed** and the door held open.

They will not allow the door to sag.

We have spared no pains to furnish a perfect article, and trust that their **superior merits** will **demand a preference.**

Reduction in Prices. Send for New List.



LIGHTNING HAY KNIVES,

WEYMOUTH'S PATENT.

This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marches.

The blade is best cast steel, spring temper, easily sharpened, and is giving *universal* satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and it *seems destined* to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each, of 50 lbs. weight, suitable for shipping by land or water to any part of the world.

Manufactured only by

HIRAM HOLT & CO.,

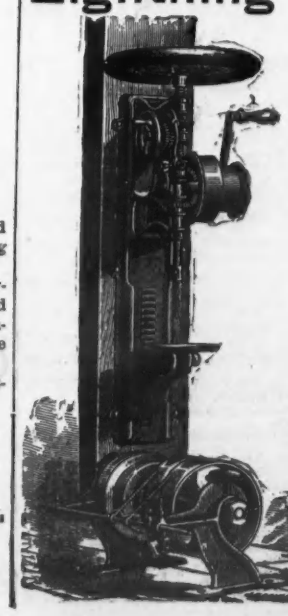
East Wilton, Franklin Co., Maine.

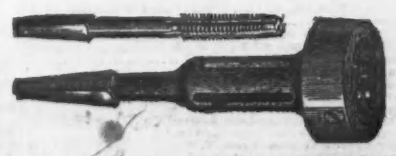
For sale by the Hardware Trade generally.

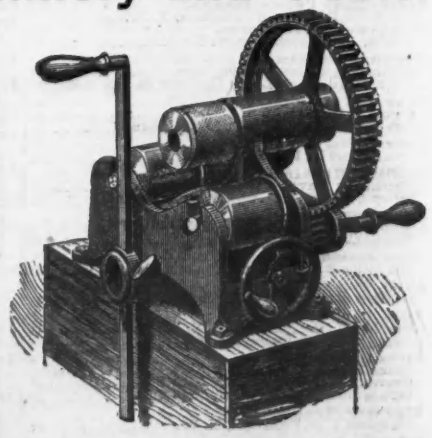
SEMPLE & BIRGE MFG. CO., Agents at St. Louis.

WILEY & RUSSELL MANUFACTURING CO., Greenfield, Mass.,

Lightning Screw-Cutting Machinery and Tools.







Lightning Screw Plates and Bolt Cutters.
Green River Drilling Machines.
Green River Tire Benders.
Green River Tire Upsetters.
Green River Horse Shoers' Vises.
Green River Tire Wheels.

Special Screw Plates for the use of Model Makers, Carriage Makers, Blacksmiths and others. Taps, Dies and Reamers for use with the Bit Brace. Tire Bolt Wrenches, Nut Wrenches, Screw Plates for threading gas pipe

Send for Illustrated Price Lists and Circular.

HENRY DISSTON & SONS

KEYSTONE SAW, TOOL, STEEL and FILE WORKS,

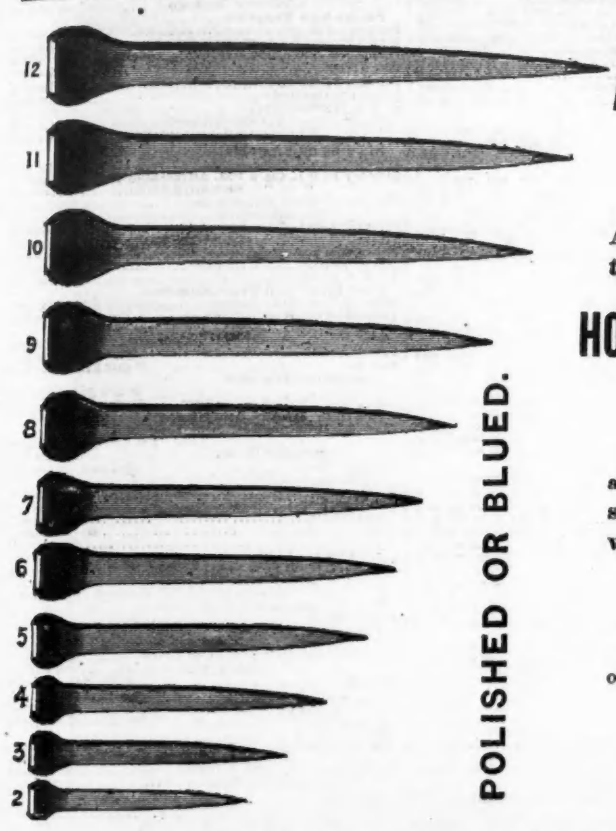
Front and Laurel Streets, Philadelphia,

MANUFACTURERS OF

SAWS OF ALL KINDS, FILES AND TOOLS, AND SPECIAL GOODS MADE FROM SHEET STEEL.

All goods stamped Henry Disston & Sons, and bearing our trade mark, are fully warranted.

Branch Works, Tacony, Philadelphia. **Branch House, Randolph & Market Streets, Chicago, Ill.**



AUSABLE HORSE NAILS, Twisted, Bent and Drawn COLD.

Hot Forged and Cold Hammered Pointed,

Are the **only Nails in market** that are made in imitation of the **Hand Process.** They have **the uniformity of Machine** Nails and the **toughness** of those hammered by hand. Our

HOT FORGED AND COLD HAMMERED POINTED NAILS

Are the Standard Nails,

and are **acknowledged to be the best in the market.** They are used by the **best shoers in New York, Brooklyn, Philadelphia, Chicago, Saint Louis, Milwaukee, Baltimore,** &c., and

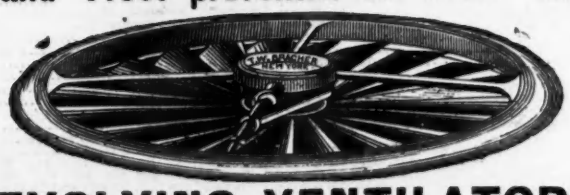
GENERALLY THROUGHOUT THE UNITED STATES.

They also compete successfully in Foreign Countries with machine and hand-made Nails of their own manufacture.

AUSABLE HORSE NAIL CO.,

4 Warren St., New York.

Steam and Frost prevented on Show Windows.



REVOLVING VENTILATORS

For everything (and every size), from a hat or cap to an exhibition building.

Kitchens, Laundries, &c., ventilated without draft. Durable, strong, without rivets or solder. Oiled for six months. Each one has storm cap. Retail price, size six inch diameter, $1.00 and upwards; apparatus with which any one can cut circles in glass, 15 cents each.

Protective Ventilators avoid drafts, exclude dust, dampness, malaria and germs of disease; adopted by hospitals, schools, institutions, &c.; applied to any window or room.

Prof. A. L. LOOMIS, M. D., University of City of New York, writes as follows:

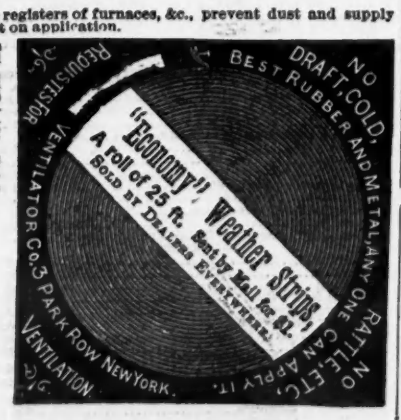
"From my personal experience and that of my patients who have used your Ventilator during the past six months, I am convinced that your method of removing dust, impurities and dampness from the atmosphere is the best which has as yet been proposed. By it the air in an apartment can be constantly changed without causing drafts. I would especially recommend its adoption in sick rooms, sleeping apartments, nurseries and school rooms."

Air Filters and Moisteners, placed over hot-air registers of furnaces, &c., prevent dust and supply *steam filtered air.* Prices and discounts to the trade sent on application.

The "**Economy**" Molding Weather Strip is perfect in every respect. By enlarging edge of rubber or felt, and making slot in molding to correspond (see engraving), we save all *after expense* of molding. Once purchased it will last a lifetime, because rubber, etc., has only to be removed by taking old piece out of either end of molding, and sliding in a new piece. By this method of securing rubber all uncertainty of *fastening* or *undoing* of glue or tacks is overcome.

Rubber supplied with enlarged edge and instructions to enable Car Manufacturers, Carpenters, Builders and far off trade to make slots in Sashes, Doors, Moldings, &c., and thus make perfect Weather Strips.

No. 6.

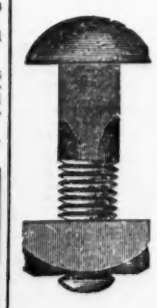


BRACHER VENTILATOR CO., No. 3 Park Row, New York.

WM. H. HASKELL & CO.

Pawtucket, R. I.,

MANUFACTURERS OF



COACH SCREWS

(With Gimlet Points),

ALL KINDS OF

Machine and Plow Bolts,

FORGED SET SCREWS,

AND

TAP BOLTS.

HENRY B. NEWHALL 11 WARREN ST. N NEW YORK AGENT.

Bergen Port Spelter.

MINES: Lehigh Valley, Pa. WORKS & FURNACES Bergen Port, N. J.

The only Miners and Manufacturers of

PURE

LEHIGH SPELTER

From Lehigh Ore.

Warranted free from any trace of Lead, an pecially adapted for

Cartridge Metal and German Silver.

Also manufacturers of

BERGEN PORT OXIDE ZINC

Superior for LIQUID PAINT on account of its bod and wearing properties.

F. OSGOOD & CO., Proprietors.

E. A. FISHER, Agent, 13 Burling Slip, N. Y.

Mica and Porcelain Materials.

THE CHESTER MICA AND PORCELAIN CO.

OFFER

Mica of the Best Quality,
Feldspar of highest Standard and Purity,
Quartz, the Finest, Whitest, Best.
Kaolin, Asbestos and Baryta.

Best Terms, Wholesale and Retail.

Address, CHESTER MICA AND PORCELAIN CO., 87 Liberty St. New York.

A. B. GUNNISON,

MANUFACTURER OF

WOOD PUMPS

ERIE, PA.

ESTABLISHED, - 1856

Warranted Genuine

Cucumber Pumps & Pipe. Also Poplar Pumps, Lined Pumps, &c.

The Trade Supplied by

H. B. GRIFFING, 60 Cortlandt St., N. Y
P. MANN, Washington, D. C.
SCOBIE, HARRISON & PARKER, 125 Liberty Street, Pittsburgh, Pa.
KNECHT & THOMAS, Winchester, Ind.

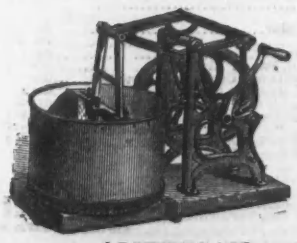
—AND BY—

A. B. GUNNISON

Manufacturer, ERIE, PA.

ATHOL MACHINE CO.,

Athol, Mass.,



MANUFACTURERS OF THE

AMERICAN
Meat and Vegetable Chopper.
Special quotations for export.

SIMPSON
Adjustable Parallel Vise.
Send for Price List.

Bemis & Call Hardware & Tool Co.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench, thus making a combination which has no equal

For Circulars and Price List, address

BEMIS & CALL HARDWARE & TOOL CO., Springfie'd, Mass.

CLEM & MORSE,

Manufacturers and dealers in

Steam & Hand-Power

HOISTING MACHINES,

Dumb Waiters, Basement and Invalid Elevators,

No. 413 Cherry St.,
PHILADELPHIA, PA.

All kinds of Hoisting Machines repaired. Estimates furnished on application.

New York Wholesale Prices, April 30, 1879.

HARDWARE.

Anvils.
Eagle Anvils (American) ... ⅌ ℔ 9c dis 20 %
Wright's ... ⅌ ℔ 10½c over 250 lbs 10¾c
Armitage's Mouse Hole ... .9¾ @ 10c
Trenton ... 10c

Augers and Bits.
Conn. Valley Mfg. Co. / Douglass Mf. Co. / Humphreysville Mfg. Co. / Ives / Beecher (French, Swift & Co) / Griswold / Nobles Mfg. Co. / Kasson's Patent } dis 50 @ 5c & 10 %
Cook's, Douglass Mfg. Co ... dis 50&5 %
Cook's, Ives' ... dis 45&10 %
Snell Mfg. Co.'s C. S. Augers ... dis 50&10 %
" " B. Machine ... dis 50 %
" " C. S. Bits ... dis 40 %
" " Jenning's Bits ... dis 35 %
Russell Jennings' Auger, Dowel, Machine-Dowel and Hand-Rail Bits ... dis 10&10&10 %
Russell Jennings' Augers ... dis 16⅔&10&10&10 %
Russell Jennings' Car and Machine Bits, Boring-Machine and Millwrights' Augers. dis 25&10&10&10 %
Imitation Jenning's Bits ... dis 35@40 %
Ives' "Jennings" Bits ... dis 25&10 %
Lewis' Single Twist Bits ... dis 40 %
Andrews Bits ... dis 50 %
Griswold's Patent Bits ... dis 30 %
Expansive Bits, Clark's, small, $18; large, $26. dis 20 %
" " Ives ... $20 @ $30—dis 33⅓ %
" " Blake's ... $20—dis 40 %
" " Parmelee's ... $20 and $30.. dis 33⅓ %
Hollow Augers Ives' / French, Swift & Co. } dis 40 %
" " Bonney's Adjust ... ⅌ doz $48—dis 40 %
" " Stearns' Adjust., ⅌ doz $48—dis 25&10 %
" " Ives' Expansive ... each $4.50—dis 40 %
" " Univ'sal Expansive, each $4.50—dis 20 %
Gimlet Bits ... $7.50 ⅌ gross, dis 50 %
" Diamond ... ⅌ doz $1.00 dis 25&10 %
" "Bee" ... dis 45&10 %
Double Cut Gimlet Bits Shepardson's ... dis 40 %
" " Ct. Valley Mfg. Co ... dis 30&10 %
" " Hartwell's ... dis 60 %
" " Douglass' ... dis 40 %
" " Ives' ... dis 50&10 %
Morse's Bit Stock Drill, List of May 15, '78 ... dis 25 %
L'Hommedieu's Ship Augers ... dis 15 %
Watrous Ship Augers ... dis 15 %

Awl Hafts.
Sewing, Brass Ferrule ... $3.50 ⅌ gross—dis 40&10 %
Peg, " ... 3.50 " dis 40&10 %
Patent Sewing, Short ... $1.00 ⅌ doz—dis 40&10 %
" " Long ... $1.40 ⅌ doz—dis 10 %
" Peg, Plain Top ... $10.00 ⅌ gross—dis 40&10 %
" " Leather Top ... 12.00 " dis 40&10 %

Awls, Brad Sets, &c.
Awls Sewing, Common ... ⅌ gross $1.35—dis 25 %
" Sewing, Best ... ⅌ gross 1.40—dis 10 %
" Shouldered Peg ... ⅌ gross 2.25—dis 15 %
" Patent Peg ... ⅌ gross .60—dis 15 %
" Shouldered Brad ... ⅌ gross $2.70—dis 25&10 %
" Handled Brad ... $7.00 ⅌ gross—dis 25&10 %
" Handled Scratch ... $7.00 ⅌ gross—dis 25&10 %
" Socket Scratch ... $1.00@$1.25 ⅌ doz—net
Brad Sets, Aiken's ... ⅌ doz $12.00—dis 40&10 %
No. 42, $10.50; No. 43, $12.50 ... dis 60&10 %
" Stanley's Excelsior, No. 1, $9.60 ... dis 25&10 %
" " " No. 2, 4.80 ... dis 25&10 %
" " " No. 3, 7.80 ... dis 25&10 %

Axes. Light. Med. Heavy.
M. H. Jones & Co ... $8.00 $8.50 $9.00 ⅌ doz net.

Axles.
Common (Guy C. Hotchkiss, Field & Co.) ... ⅌ ℔ 3½c
Solid Collar, Case Hardened, Chilled Box ... ⅌ ℔ 8c
Axle Grease.—Frazer's ... ⅌ ℔ 6c

Balances.
All Spring Balances ... dis 25&10 %

Bells.
Hand, Light Brass ... dis. 75 @ 75&5 %
" Extra Heavy ... dis 50 %
" White Metal ... dis 70 %
" Silver Chime ... dis 25&10 %
" Swiss ... dis 25 %
" Globe (Cone's Patent) ... dis 25&10 %
Gong, Abbe's ... dis 30&10 %
" Yankee ... dis 40&10 %
" Barton's ... dis 40&2 %
Crank, Taylor's ... dis 25&10 %
" Brook's ... dis 50 %
" Cone's ... dis 10 %
" Connell's ... dis 50&10 %
Lever, Sargent's, new list Dec., '78 ... dis 60&10 %
" Taylor's Bronze or Plated Lever ... net
" " Japanned Lever ... dis 25&10 %
" Hart, Bliven & Mead Mfg. Co ... dis 50&10&2 %
Pull, " " " " ... dis 50&10&2 %
" Brook's ... dis 50 %
" Western ... dis 25&10 %
Call ... dis 25 %
Cow, Common Wrought ... dis 20&10 %
" Western ... dis 20&10 %
" " Sargent's new list ... dis 20&10 %
" Kentucky "Star" ... dis 20&10 %
" " Sargent's new list ... dis 20&10 %
" Dodge's Genuine Kentucky, new list—
Nos. 0 1 1½ 2 3 4 5 6 Hog } dis
$12.00 10.00 9.00 8.00 6.00 5.00 3.50 2.50 5.00, } 50&10 %
" Yaw's Genuine ... dis 50 %
" Texas ... dis 50 %
" Wilson's Moore's ... dis 50 %

Bellows.
Blacksmiths', Common ... dis 45 %
" Extra and Pittsburgh Pattern ... dis 20 %
Moulders ... dis 25 %
Hand Bellows ... dis 20 %

Belting, Rubber.
N. Y. Belting and Packing Co ... new list net

Bit Holders.
Extension, Barber's ... ⅌ doz $15.00—dis 40&5 %
" Ives' ... ⅌ doz $15.00—dis 40 %
Diagonal ... ⅌ doz $24.00—dis 40 %
Angular ... ⅌ doz $24.00—dis 40 %
Blind Adjusters.—Domestic ... ⅌ doz $3.00, dis 20 %
Blind Fasteners.—Mackrell's ... dis 30 %
Van Sand's ... No. 2000, per gross, $7.00—dis 10 %
" old pattern ... ⅌ gross $10.50, dis 33⅓ %
Washburn's Patent ... ⅌ gross $14.00, dis 40 %
Merriman's ... new list net
Mackrell's ... ⅌ doz. $0.65, dis. 10 %

Blind Staples.
Boardman's Patent, ½ in. and larger ... ⅌ ℔ 15c net
" ⅜ in ... ⅌ ℔ 20c dis net
Blocks.—Burr & Co ... dis 25 %
Differential Pulley Blocks ... dis 20 %
Penfield Block Works, Rope and Iron Strap'd ... dis 40 %
" " " Wrot. Iron Com. bushed. dis 30 %
" " " " " all steel roll'r. dis 15 %
" " " Sheaves " dis 30 %
Stanley R. & L. Co., Rope and Iron Strap'd. dis 35&10 %

Bolts.
Cast Iron Barrel, Shutter, &c ... dis 70&10&10 %
Cast Iron Chain (Sargent's list) ... dis 70&10&10 %
Bush's Lever and Chain Bolts ... dis 40, 10&10 %
Wrought Iron Barrel ... dis 60&10 %
" Square ... dis 60&10 %
" " Shutter (Stanley's list) ... dis 50 %
" " " (Sargent's list) ... dis 65&10 %
" " Sunk Flush, Sargent's ... dis 66⅔&10 %
" " " " Stanley's ... dis 25&10 %
" " B.K. Flush, Com'n, Stanley's .. dis 50&7½ %
" " " " Ex. Heavy, " dis 40&10 %
" " Plated Knob & Slide Flush " dis 50&10 %
Carriage and Tire, Common ... dis 75&3 % cash
" " Norway Iron ... dis 70 %
" " R. B. & W ... (old list) dis 70&5 %
" " Philadelphia ... dis 70 %
" Coleman ... dis 60&10 @ 60&20 %
" Shelton's ... (old list) dis 70&5 %
Tire, Am. Screw Co.'s, Phila ... dis 70&5 @ 70&10 %
" "Bay State" ... dis 75&10 @ 80 %
Star (Phila) ... dis 60&10@60&20 %
Stove—American Screw Co.'s ... dis 55&5 @ 60 %
" R. B. & W ... dis 50&10&5 %
Plow ... dis 50&10 %
" R. B. & W ... dis 50 %
Machine ... dis 70& 5 %
Bolt Ends ... dis 60 %
Borax ... 10½@11½c ⅌ ℔ net

Boring Machines. Upright. Angular.
First quality, no Augers ... $5.00 $6.75 dis 45&10 %
" with Augers ... 8.50 10.25 dis 45&10 %
Snell's, no Augers ... 4.75 6.25 dis 40 %
Phillips' with Augers ... . 6.00 dis 37

Bow Pins.
Hotchkiss' ... low list dis 10 %
Humason, Beckley & Co.'s ... dis 60&10 %
Sargent & Co.'s ... $10.70 and $21.40, dis 70&10 %
Braces.—Barber's Patent ... dis 40&5 %
O. S. Backus ... dis 50&10 %
Wilson Mfg. Co ... dis 10 %
Spofford's Patent ... dis 50&5 %
Noble's Patent ... dis 40&5 %
Ives' Patent Braces ... dis 55 %
Common Ball (American) ... dis 35 @ 10 %
Brackets.—Shelf (Sargent's) ... dis 66⅔&10 %
Swing (T. & S. Mfg. Co.) ... dis 33⅓ %
Bright Wire Goods ... dis 70&10 %
Bull Rings.—Union Nut Co ... dis 50&20 %
Sargent's ... dis 70&10 %
Hotchkiss' ... low list dis 10 %
Humason Beckley & Co.'s ... dis 60&10 %

Butts.
Wrought Brass ... dis 60 %
Cast Brass, Tiebout's ... dis 40&10 %
" Corbin's ... dis 50&10 %
COMMON CAST, NOT DRILLED.
Fast Joint, Narrow ... dis 60&10 %
" Broad ... dis 65&10 %
Loose Joint, Narrow and Broad ... dis 70&10 &10 %
DRILLED AND WIRED.
Fast Joint, Narrow ... dis 55&10 %
" Broad ... dis 60&10 %
Loose Joint / Japanned / with Acorns } ... dis 75 %
Parliament Butts ... dis 65&10 %
Mayer's Hinges ... dis 75&10 %
Loose Pin no Acorn ... dis 70&10&10 %
" Acorns ... dis 70&10&10 %
" " Japanned ... dis 70&10&10 %
" Plated Tips ... dis 70&10 %
Union Mfg. Co.'s Fancy Butts—
Figured Enameled Loose Joint ... dis 65&10 %
Boston Finish, Plain ... dis 80&10 %
" " with Iron Acorns ... dis 75&10 %
" with Silvered Acorns ... dis 70&10 %

WROUGHT IRON.
Fast Joint Narrow / Lt. Narrow / Broad / Loose Joint, Broad / Table Butts, Back Flaps, &c / Inside Blind, Regular / " Light / Loose Pin, Wrt. } dis 60 %
Spring Hinges:
American Spiral Spring Butt Co., Jap'd ... dis 25 %
" " " Fancy ... dis 10 %
Geer's Single and Double Acting ... dis 25 %
Sabin Mfg. Co.'s Double Acting ... dis 35 %
Centennial, Japanned ... dis 25 %
" Ornamental ... dis 20 %
Union Spring Hinge Co.'s ... dis 25 %
American Spring Hinge Co.'s ... dis 25 %
Union Mfg. Co ... dis 25 %
Bommer's ... dis 25 %
Blind Butts, Parker ... dis 75&10 %
" Palmer ... dis 40&10&10&2 %
" Seymour ... dis 65&10 %
" Shepard ... dis 70&10 %
" Lull & Porter ... dis 66⅔&10 %
" Nicholson ... dis 45&10 %
" Huffer ... dis 50@10 %
" Clark's, Nos. 1, 3, 5, 40 and 45 ... dis 75&10 %
" Buffalo "Noiseless" ... dis 75&10 %
" Sargent's ... dis 80&10 %

Butchers' Cleavers.
Humason & Beckley Mfg. Co ... dis 25 %
Bradley's ... dis 25 %
Beatty's ... dis 35 %
1 2 3 4 5 6 7 8
$16.50 19.00 21.50 24.00 27.00 30.00 33.50 36.50
Hart Mfg. Co ... dis 50&10&2 %
0 1 2 3 4 5 6
$20.00 26.00 29.50 33.00 37.00 41.50 45.00

Can Openers.
Messenger's Comet ... ⅌ doz $3.00, dis 20 %
American ... ⅌ doz $2.25, dis 75 %
Duplex ... ⅌ doz 25c, dis 15@20 %
Lyman's ... ⅌ doz $3.75, dis 20 %
Poole ... ⅌ doz $3.75, dis 40 %
No. 4, French ... ⅌ doz $2.25, dis 60 %
No. 5, Iron Handle ... ⅌ gross $6.00 net
Eureka ... ⅌ doz $2.50, dis 10 %
Sardine Scissors ... ⅌ doz $7.00, dis 55 %
Star ... ⅌ doz $5.00, dis 25 %

Caps—Percussion, ⅌ 1000.
Hicks & Goldmark's G. D. & S. R ... 35c
" " E. B. 1-10 Ground ... 70c, dis 5 %
" " E. B. 1-10 Turned ... 65c, dis 5 %
" " D. W. P. 1-10 ... $1.40, dis 5 %
" " D. W. P. ¼ ... 1.35, dis 5 %
" " Colt's 1-10 ... 70c, dis 5 %
F. L ... 50c, dis 6 %
Ely's E. B ... 1-10s, 65 @ 68c
" Double Waterproof, ... 1-4s, $1.50; 1-10s, $1.58c
Colt's ... 1-10s, 80c
Cartridges.—Metallic ... dis 60&7 %
Cards.—Horse and Curry ... dis 33⅓&10 %
Cotton ... dis 25&10 %
Wool ... dis 25&10 %
Car Pusher.—"Giant" ... $6.25 each, dis 20 %

Carpet Stretchers.
Cast Steel, Polished ... ⅌ doz $5.00, dis 30 %
" Iron Steel Points ... ⅌ doz $2.00, dis 55 %

Casters.
Bed ... dis 55 %
Plate and Shallow Socket ... dis 55 %
Deep Socket ... dis 40 %

Cattle Leaders.
Hotchkiss' Sons' ... dis 10&10 %
Humason, Beckley & Co.'s ... dis 60&10 %
Sargent's ... dis 70&10 %

Chain.
Trace, 6½-1-2 ... by the cask, ⅌ pair 45 @ 46c
" 6½-10-3 ... by the cask, ⅌ pair 43 @ 44c
" 7-10-2 ... by the cask, ⅌ pair 40 @ 50c
German Halter Chain ... dis 40&10 %
" Coil ... dis 40&10 %
Oneida Halter Chain ... dis 40 %
Galvanized Pump Chain ... ⅌ ℔ 10½c dis 10 %
Jack Chain, Iron ... dis 60&10 %
" Brass ... dis 55&10 %

Chalk.
White ... ⅌ gross 55c net
Red ... ⅌ gross 75c net
Blue ... ⅌ gross 90c net
White Crayons ... ⅌ gross 14½c net

Chisels.
Socket Framing, Crossman ... dis 70 & 5 %
" " Buck Bros ... new list. dis 25 %
" " Merrill ... dis 70 %
" " Witherby Tool Co ... dis 70 %
" " Douglass' ... dis 70 %
" Firmers, Crossman ... dis 70&5 %
" " Buck Bros ... new list. dis 25 %
" " Merrill ... dis 70 %
" " Witherby Tool Co ... dis 70 %
" " Douglass' ... dis 70&5 %
" Corner ... dis 65@70 %
Tanged Firmers extra ... dis 40 %
" " Butcher's ... $5.00 @ $5.25 to £
" " Spear & Jackson's ... 5.00 to £
" " Buck Bros (Shank) ... 5.00 to £

Clamps.
Iron, Providence Tool Co.'s, Wrt. Iron ... dis 25 %
" Adjustable, Gray's ... dis 20 %
" " Lambert's ... dis 20 %
" " Snow's ... dis 40&5 %
" " Hammer's ... dis 15 %
" " Stearns' ... dis 15&10 %
" Cabinet, Sargent's ... dis 60&10&10 %
" Carriage Makers', Sargent's ... dis 60&10&10 %
" Cord and Tape (T. & S. Mfg. Co.) ... dis 30 %

Clips, Axle.
Norway or Best ... dis 60%
Superior ... dis 60&10 %
Cockeyes ... 1¼ in., 28c.; 1⅜ inch, 33c.; 1¾ in., 37c, net

Cocks, Brass.
Racking, new list ... dis 50 %
Globe, " ... dis 50 %
Plain Bibbs, " ... dis 50 %
Ale and Beer, new list ... dis 50 %

Coffee Mills.
Board and Box ... dis 25 %
Increase Wilson's ... net
Selsor's Pat ... $9.50, $10.50, dis 25 %
American (Enterprise Mfg. Co.) ... dis 20 %
French Steel ... dis 20 %
The Swift (Lane Bros.) ... dis 25 %

Combined Dinner Pail and Lantern.
Per doz $14.00 ... dis 30 %

Compasses, Dividers, &c.
Compasses ... dis 45 %
Callipers ... dis 45&10 %
Dividers ... dis 55 %
Bemis & Call Co.'s Dividers ... dis 60&20 %
" " Compasses & Callipers ... dis 55 %
" " Wing & Inside or Outside. dis 50&5 %
" " Double ... dis 60 %
" " Call's Pat. Inside ... dis 35&10 %
Cook's ... dis 15 %
Excelsior ... dis 50 %
Miller's Patent ... dis 25 %

Coopers' Tools.
Bradley's ... dis 15 @ 20 %
Corkscrews.—Humason & B ... dis 40 %
Corn Knives and Cutters.—Bradley's ... dis 10 %

Crow Bars.
Cast Steel ... ⅌ ℔ 9c net
Iron, Steel Points ... ⅌ ℔ 5c
Crucibles.—Gautier & Co ... ⅌ No. 5½c

Curling Irons, &c.
⅜, ⅝, ¾ in., $1.80, 2.00, 2.40 ... dis 10 %
Curling Tongs ... ⅌ doz $3.65, dis 10 %
Pinching Irons ... ⅌ doz 7.50, dis 20 %

Curry Combs.
Fitch's (List of No. 240, $1) ... dis 50 %
Hotchkiss' & Kellogg's, Iron & Brass, old list. dis 4 &7½ %
Hotchkiss' Novelty ... dis 20&10 %
Rubber ... ⅌ doz $9.00, dis 20&10 %
Curtain Pins.—Silvered Glass ... dis 15 %
White Enamel ... dis 15 %

Cutlery.
Meriden Cutlery Co. (Table) ... net
Am. Miller Bro.'s Cutlery Co ... dis 25 %
Humason & Beckley, Pocket ... dis 33⅓ %
Naugatuck Cutlery Co ... list net
Aaron Burkinshaw's Pocket ... dis 35 %

Dog Collars.
Embossed Gilt ... dis 20 %
Leather ... dis 30 %
Brass ... dis 25 %

Door Springs.
Torrey's Rod ... ⅌ doz $1.75 net
Gray's " ... ⅌ doz $1.65, net
Gem (Coil)—
No. 1, Large, Japanned ... ⅌ doz $3.50 }
No. 2, Medium, " ... ⅌ doz 2.50 } dis 15 %
No. 3, Small, " ... ⅌ doz 2.00 }
Challenge (Coil)— Nos. 9 7 6
Japanned ... ⅌ doz $2.00 2.50 3.50 }
Coppered ... ⅌ doz 4.00 4.50 5.00 }
Galvanized ... ⅌ doz 3.50 4.00 4.50 } dis 30 %
Nickeled ... ⅌ doz 5.50 6.00 7.00 }
Premium (Coil)— Nos. 1 2 3
Japanned ... ⅌ doz $7.50 6.25 5.00 } dis 30 %
Nickeled ... ⅌ doz 11.00 9.50 8.00 }
Star (Coil)—For Cop'd, Nickel-Plated, &c., see list.
No. 4, ("Shoo Fly") Screen door size ⅌ doz $1.75 }
No. 5, Screen Door Size ... ⅌ doz $2.00 }
No. 6, Medium ... ⅌ doz 2.50 } dis 30 %
No. 7, Large ... ⅌ doz 3.50 }
Sabin's Lever. No. 1, $1; 2, $1.50; 3, $2; 4, $2.50; dis 35 %
Sabin's Boss, No. 1, $5.40; 2, $4.20; 3, $3.60. dis ... 50 %
Sabin's Crown ... ⅌ doz $2.75, dis 50 %
Philadelphia ... 5 in., $5.00; 8 in., $7.00, dis 35 %
Barker's Concealed ... dis 20 %
Cowell's ... No. 1, $18.00; No. 2, $15.00 ⅌ doz, dis 50 %
Rubber, complete ... ⅌ doz $1.90, net

Drawing Knives.
Crossman's No. 1 ... dis 70&5 %
Merrill ... dis 70 %
Nobles Mfg. Co ... dis 15 %
Bradley's ... dis 35 %
Adjustable Handle ... dis 20 %
Witherby Tool Co ... dis 70 %
Douglass ... dis 70 %

Drills and Drill Stocks.
Blacksmiths' ... each $1.80 net
Blacksmiths' Self Feeding ... each $7.50, dis 10 %
Breast, P. S. & W ... dis 25&10%
" Hotchkiss ... dis 20 %
Breast, Wilson's ... dis 20 %
" Miller's Falls ... each $2.50. dis 25 %
Ratchet, Merrill's ... dis 25 %
" Ingersoll's (old list) ... dis 35 %
" Whitney's ... dis 30 %
" Weston's ... dis 20 %
" Moore's Triple Action ... dis 20 @ 25 %
Whitney's Hand Drill ... dis 20&10 %
Wilson's Drill Stocks ... dis 15 %
Automatic Boring Tools ... each $2.75, dis 30 %
Drill Chucks.—Morse's Beach Patent ... dis 30 %
" Adjust. each $10.00, dis 10 %
Danbury ... $8.00, dis 30 %

Egg Beaters.
Dover ... ⅌ doz $5.00, dis 25 %
Family ... ⅌ doz $3.00 net
National ... ⅌ doz $4.50, dis 33⅓ %

Elevator Buckets.
Mill E. Buckets, light, 3½ to 10 in., (Duc's Improved) ⅌ 100 $15.00 @ $54.00, net
Mill E. Buckets, heavy, 5 to 10 inches (Duc's Improved) ⅌ doz $5.60 @ $10.20, net
Storehouse, (Duc's Patent) 12 to 17, $12.00 @ $20.00 ... net

Emery and Emery Paper.
Genuine Chester—Regular Nos ... ⅌ ℔ 6c
" " Flour and FF ... ⅌ ℔ 5c
" " in 10-lb. cans ... 2c extra
Washington Mills—Regular Nos ... ⅌ ℔ 8c
" Flour ... ⅌ ℔ 5c
Wellington Mills, Grain ... ⅌ ℔ 10c net
" " Flour ... ⅌ ℔ 8c net
Hampden Emery Grain ... 5c net
" " Flour ... 3c net
B. & A. Emery Paper ... dis 20 %

Enameled and Tinned Ware.
Kettles ... dis 45 %
Sauce Pans ... dis 35 %
Tinned Sauce Pans ... dis 35 %

Escutcheon Pins.
Iron ... dis 33⅓ %
Brass ... dis 35&10 %

Escutcheons.
Door Lock ... Same discounts as Door Locks
Brass Thread ... dis 60&10 %
Wood ... dis 25 %

Faucets.
Fenn's ... dis 50 %
Fenn's Cork Stops ... dis 40 %
Star ... dis 55&10 %
Frary's Patent Petroleum ... dis 20&10 %
Wood and Metallic ... dis 40 %
West's Patent Key ... dis 40 %
Metallic Key, Leather Lined ... dis 45 %
Cork Lined ... dis 70&10 %
Enterprise (Self Measuring) ... ⅌ doz, $36.00, dis 20 %
Felloe Plates ... ⅌ ℔ 15c, dis 50 %

Files.
American File Co ... $5.00 to £, dis 35 %
Auburn ... $5.00 to £, dis 35 %
Arcade ... $5.00 to £, dis 35 %
G. & H. Barnett ... dis 25 %
Nicholson ... (Nicholson List) dis 35 %
Heller & Bros ... $5.00 to £ dis 25 %
Madden & Cockayne File Co ... $5.00 to £, dis 25 %
J. & Riley Carr ... 4.50 to £
Stubs' ... $7.00 @ 7.50 to £
Butcher's ... 4.50 to £
Walter Spencer & Co.'s "Diamond" ... 4.50 to £
Fisher's ... 4.75 to £
Moss & Gamble ... 4.50 to £
H. Disston & Sons (new list) ... dis 35 %
Limet & Co. (French) ... $4.25 to £

Fluting Machines.
Knox, 4-inch Rolls ... $2.50 each net
" 6 " " ... 3.00 each net
" 8 " " ... 5.00 each net
Peerless, 4-inch Rolls ... 4.00 each net
" 5 " " ... 4.75 each net
Eagle, 3½-inch Roll ... $1.62½ each net
" 5½ " " ... $2.12½ each net
Eureka, No. 1, 7-inch Roll ... 6.50 each, dis 33⅓ %
" No. 2 5-inch Roll ... 5.50 each, dis 33⅓ %
Crown ... 4½-in., $2.62½; 6-in., $3.00; 8-in., $5.00 each net
Star ... 4½ in., $3.50; 6 in., $4.00 each net
Crown Jewel, ... 6 in., $2.50 each net
Domestic Fluter ... 1.50 each net
Geneva Hand Fluter, No. 1 ... ⅌ doz $15, dis 20 %
Crown Hand Fluter ... ⅌ doz. $12. net
Shepard Hand Fluter ... No. 75 ⅌ doz $15, dis 10 %
" " " ... No. 104, ⅌ doz $12.00 net
Clark's Hand Fluter ... ⅌ doz $15.00, dis 20 %
Combined Fluter and Sad Iron ... ⅌ doz 15.00, dis 30 %
Buffalo ... ⅌ doz 10.00, dis 10 %
Fluting Scissors ... dis 45&10 %

Forks.
Hay, Manure and Spading ... new list, dis 15 %
Plated "A 1, Rogers & Bro ... dis 40&5 % cash
" Reed & Barton ... dis 40&5 %

Fruit and Jelly Presses.
Enterprise Mfg. Co ... dis 20 %

Fry Pans.
Burnished, list as follows ... dis 60&10 %
No ... 0 1 2 3 4 5 6 7 8
⅌ doz ... $3.00 $3.75 4.25 4.75 5.25 6.00 7.00 8.00 9.00
Acme Patent, same list as above ... dis 45 %

Gauges.
Marking, Stanley's ... dis 50&10 %
" Chapin's ... dis 50&10 %
" Star ... dis 35 %
Wire ... dis 10 %
" Smith's Patent ... ⅌ doz $18.00, dis 40 %

Gimlets.
Nail and Spike ... dis 55 %
"Bee" Gimlets ... ⅌ gross $12.00, dis 60&10 %
"Eureka" Gimlets ... dis 50 %
"Diamond" Gimlets ... dis 20&10 %
Double Cut, Shepardson's ... dis 40 %
" " Hartwell's ... dis 50 %
" " Ives' ... dis 55 %
" " Douglass' ... dis 40

Glue Pots.
Tinned and Enameled ... dis 50 %
Family, Howe's "Eureka" ... dis 30 %
" L. F. & C.'s "Handy" ... dis 40 %

Grindstone Fixtures.
Sargent's Patent ... dis 75&10 %
Reading Hardware Co ... dis 40&10&2 %
" " "Keystone" ... dis 45&5&10&2 %

Hammers.
Maydole's, New List of Dec. 10th, 1878 ... dis 15 %
Cheney's, List January, '79 ... dis 25 %
H. Hammonds ... dis 20 %
Verree ... dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 and 1.75. dis 25&10 %
Warner & Noble's ... dis 10 %
Kip's (new list, Dec. '78) ... dis 25 %

Hand Cuffs and Leg Irons.
Providence Tool Co.'s Hand Cuffs, $15.00 ⅌ doz } dis 10 %
" " Leg Irons, $25 ⅌ doz ... }
Tower's ... dis 25 %

Handles.—Door or Thumb Latches—
Nos ... 0 1 2 3 4
Per doz ... $0.80 1.00 1.18 1.35 1.50 ... dis 70&10 %
Roggin's Latches ... per doz 30 @ 33c net
Bronzed Iron Drop Latches ... ⅌ doz 60 @ 66c net
Jap'd Store Door Handles—Nuts, $1.25; Plate $0.80
" no Plate, 65c ... net
Barn Door ... per doz $5.00, dis 70&10&10 %
Wrought Chest ... dis 70 %
Surface Chest, Sargent's list ... dis 75&10 %
Flush Chest ... dis 70&10 %
Lifting ... dis 70 %
Saw and Plane ... dis 40&10 %
Hammer and Hatchet ... dis 20 %
Brad Awl ... ⅌ gross $2.00, dis 25&10 %
Hickory Firmer Chisel, assorted, ⅌ gross $4.50 }
" " large, " 5.00 }
Apple " " assorted, " 5.00 }
" " " large, " 6.00 }
Socket " " assorted, " 3.00 } dis 25&10 %
" Framing " assorted, " 5.00 }
File, assorted, ⅌ gross ... 2.75 }
Auger, assorted, ⅌ gross ... 6.00 }
" large, " ... 7.00 }
Patent Auger, Ives' ... dis 25&10 %
" Douglass' ... ⅌ set $1.25, dis 10 %
" Swan's ... ⅌ set $1, dis 20&10 %

Hangers.
Barn Door ... dis 70&10&10 %
Novelty ... dis 40 %
Challenge ... dis 50 %
Climax (Anti-Friction) ... dis 50&10 %
Sterling Improved (Anti-Friction) ... dis 75&10 %
Cheritree ... dis 20 %

Harness Snaps.
Henshaw's ... List of 1⅛ changed to $14.00, dis 55 %
Judd's ... " " " 14.00, dis 60 %
Fitch's (Bristol) " 14.00, dis 55 %
Hotchkiss' ... dis 10 %
Andrews' ... dis 50 %
Sargent's ... dis 66⅔&10 %
New York Wire ... dis 20&20 %
"German" ... dis 70 %

Hatchets.
Isaiah Blood ... dis 30 %
Shingling, Nos. 1 2 3 ... ⅌ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 ... ⅌ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 ... ⅌ doz 7.50 8.00 8.50
Hunt's ... dis 20 @ 10 %
Shingling, Nos. 1 2 3 ... ⅌ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 ... ⅌ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 ... ⅌ doz 7.50 8.25 9.00
Hurd's ... dis 45 %
Shingling, Nos. 1 2 3 ... ⅌ doz $8.00 $8.50 $9.00
Claw, Nos. 1 2 3 ... ⅌ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 ... ⅌ doz 8.00 8.50 9.00
Simmon's ... dis 35 %
Shingling, Nos. 0 1 2 3 ... ⅌ doz $7.50 $8.00 $8.50 $9.00
Claw, Nos. 1 2 3 ... ⅌ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 ... ⅌ doz 8.00 8.50 9.00
Broad, Nos. 1 2 3 4 ... ⅌ doz 9.00 10.00 12.00 14.00
" Nos. 5 6 7 8 ... ⅌ doz 16.00 18.00 20.00 22.00
Collins ... dis 10 %
Shingling, Nos. 1 2 3 ... ⅌ doz $6.00 $6.50 $7.00
Claw Nos. 1 2 3 ... ⅌ doz 6.50 7.00 7.50
Lathing, Nos. 1 2 3 ... ⅌ doz 6.00 6.50 7.00
M. H. Jones & Co ... dis 45 %
Shingling, Nos. 1 2 3 ... ⅌ doz $8.00 $8.50 $9.00
Half Hatchets, Nos. 1 2 3 ... ⅌ doz 8.00 8.50 9.00
Claw, Nos. 1 2 3 ... ⅌ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 ... ⅌ doz 8.00 8.50 9.00
Broad, Nos. 2 3 4 ... ⅌ doz 11.00 13.00 14.50
" Nos. 5 6 7 ... ⅌ doz 16.50 18.00 19.50

Hay Knives.
"Lightning" ... ⅌ doz $20.00 net
Wadsworth's ... dis 30 %

Hinges.
Gate, Western ... ⅌ doz $6.25, dis 70&10 %
" N. E ... ⅌ doz $10.13, dis 70&10 %
" N. E. Reversible ... ⅌ doz $10.13, dis 70&10 %
Gate, Clark's No ... ⅌ doz $6.00, dis 50&10 %
" N. Y. State ... ⅌ doz $6.10, dis 70&10 %
" Automatic ... ⅌ doz $12.50 dis 40 %
" Common Sense ... dis 20 %
" Seymour's ... dis 40&10 %
" Shepard's ... No. 25 ⅌ doz $6.00, dis 50 %
Rolled Blind Hinges ... dis 60&10&10 %
Rolled Plate ... dis 60&10 %
Rolled Raised ... dis 60&10 %
Wrought Strap and T, list Dec. 20, '77 ... dis 60&10 %
Plate Hinges { 6 to 10 in. 5c ⅌ ℔ / "Providence" ... { over 10 in. 4c ⅌ ℔ } ... dis 10 %
Screw Hook and Strap ... { 8, 10, 12 in., 11c / 14 to 36 in., 9½c } dis 50&10 %
Heavy Welded Hook ... { 8 to 12 in., 11c / 14 in. & up, 9½c } .. dis 30 %
Screw Hook and Eye ... { ¾ & 1 in., 10c / ⅝ in. 12c / ½ in. 14c / ⅜ in. 16c } dis 35 %

Hoes.—Solid Shank, C. S ... ⅌ doz $5.25, dis 15 %
Socket ... ⅌ doz 5.75, dis 15 %
Riveted Shank ... ⅌ doz 3.25 dis 15 %
Grub ... dis 30 %
Planters' ... dis 30 @ 35 %
Scovill Pattern ... dis 25 @ 30 %
Scovill Pattern, Handled ... dis 25 %
Hick's Pat. Solid C. S. Planters' ... dis 20&10 @ 30 %
" " Scovill Pattern dis 20&5 @ 35 %
Winsted & Lane, Planters ... dis 25@30 %
" " Scovill Pattern ... dis 20@25 %

Hooks.
Bird Cage, Sargent's list ... dis 70&10@70&10&10 %
Cotton ... dis 50 %
Cotton (Humason & Beckley Mfg. Co.) ... dis 40 %
Belt, (new list) ⅌ c ... dis 30&10 %
Bench—Hotchkiss', $5.00 ⅌ doz ... dis 10 %
" Weston's, No. 1, $10.00; No. 2, $9.00 ⅌ doz dis 25 %
" McGill's, $3.00 ⅌ doz ... dis 10 %
" Skinner's, $6.25 per doz ... dis 20 %
Clothes Line, Hart's list ... dis 60&10&5&10 %
" Sargent's list ... dis 70&10&10 %
" Reading list ... dis 50&10&2 %
Ceiling .. { Hart's list ... dis 70&10 %
Harness. { Sargent's list ... dis 70&10 %
{ Reading list ... dis 50&10&2 %
Coat and Hat, Hart's list ... dis 65&5&10 %
" Sargent's list ... dis 70&10 %
" Reading ... dis 50&10&2 %
" T. & S. Mfg. Co's list ... dis 25 %
Tassel (T. & S. Mfg. Co.) ... dis 40 %
Wrought Staples and Hooks and Staples, dis 75&10 @ 80 %
" Staples, Stanley's list ... dis 40 %
Wire Screw Hooks and Eyes ... dis 70&10 %
Grass and Bush ... dis 40@45 %
Whiffletree—Patent ... dis 40 %
Hooks and Eyes—Malleable Iron ... dis 70&10 %
" Brass ... dis 70&10 %

Horse Nails
Nos. 5 6 7 8 9 10
Ausable ... ⅌ ℔ 30c 27c 25c 24c 23c 22c } dis
" Finished, Polished or Blued ... " 31c 28c 26c 25c 24c 23c } 20 %
A C ... 60 50 40 26 24 22 21 20 19 18 18 18c } dis
Nos ... 1 2 3 4 5 6 7 8 9 10 11 12 } 15 %
Bridgewater Iron Co. { Nos. 5 6 7 8 9 10
Pointed and Polished { 26c 23c 21c 20c 19c 18c
Nos. 5 6 7 8 9 10
Cortland P't'd & Blued .. 26c 23c 21c 20c 19c 18c
Globe (New list) .. { Nos. 5 6 7 8 9 10
26 23 21 20 19 18c net
H. P. Pointed and Finished ... 26 23 21 20 19 18 } dis 20 %
North Western Fini'h'd 26 23 21 20 19 18c net
" " Plain 25 22 20 19 18 17c net
National, Pointed and Polished, Pat. Fin ... 25 23 22 21 20c net
Putnam Hammer, P't'd 26 23 21 20 19 18c net
Vulcan P't'd & Blued. 26 23 21 20 19 18c net
Horse Shoes.—Burden ... ⅌ keg $3.37½
R. I. Horse Shoe Co., Perkins' Improved Light, Medium and Heavy ... ⅌ keg 3.37½
Mule Shoes ... ⅌ keg 4.37½
Perkins' Snow ... ⅌ keg 3.87½

Ice Awls, Chisels, &c.
American Ice Chisel ... ⅌ doz. $6.00 dis 45 %
National " ... ⅌ doz $6.25 dis 20 %
Novelty Ice Breakers ... ⅌ doz $6.25 dis 20 %
White's Sliding Head Picks ... ⅌ doz $2.50 dis 40 %
Dunlap's Ring Picks ... ⅌ doz $3.00, dis 25 %
Wood Head Picks, Sargent's ⅌ doz $1.85, dis 60&10&10 %
Iron " ⅌ doz 1.85, dis 60&10&10 %
Ice Mallets Pick in Head ... ⅌ doz 1.75 net
" Pick in Handle ... ⅌ doz 3.00 net
Ice Axes, Small Cast or Malleable ... ⅌ doz 1.20 net
Kitchen Ice Tongs ... ⅌ doz 2.25 net
Combination Ice Tools ... ⅌ doz $2.50 dis 30&10 %

Kettles.
Brass, 7 to 13 inches inclusive ... ⅌ ℔ 35c net
Brass, larger than 13 inches ... ⅌ ℔ 40c net
Enameled ... dis 45 %

Knives.
Ames' Butcher Knives ... dis 20 %
" Shoe ... dis 15 %
" Bread ... ⅌ doz $1.50, dis 15 %
Moran's Shoe and Bread Knives ... dis 20 %
Hay and Straw—"Wadsworth's" ... dis 30 %
Table and Pocket ... See Cutlery

Knobs.
Carriage (Jap'd 80c. ⅌ gross) ... dis 60&10 %
Base—Common ... dis 30&10 %
" Elastic End, No. 8 ... dis 70 %
Hemacite Door Knobs ... dis 35 %
Door, Mineral / " Por. Jap'd / " " Plated / " " Por. } Same discounts as Door Locks.
Furniture, Plain ... 75c gross inch, dis 10 %
" Wood Screws ... dis 20 %
Picture (T. & S. Mfg. Co.) ... dis 40 %
" Sargent's ... dis 60&10&10 %
Hemacite Picture ... dis 35 %
Shutter, Porcelain ... dis 60&10&10 %

Ladles.
Melting—Hart's ... dis 55&10 %
" Sargent's ... dis 50&10 %
" Reading ... dis 35&10&2 %
" Monroe's Patent ... ⅌ doz $4.00, dis 20 %

Lanterns.
Tubular ... No. 0, $10.00; No. 1, $11.50 / With Guards, 50c extra. } net
Hurricane ... dis 25 %
Peerless ... No 5, ⅌ doz $11.75, dis 10&10 %
Brady's Patent ... dis 10&10 %
Ætna ... dis 10&10 %
Yankee ... dis 10&10 %
De Beque ... dis 10&10 %
Police. Small, $7.50; Med., $9.00; Large, $12.00 dis 20&10 %
Convex Reflector ... $3.60 ⅌ doz, dis 10 %

Lemon Squeezers.
Porcelain Lined ... ⅌ doz $4.00 net
Eureka, Tinned ... ⅌ doz $8.00, dis 10 %
Dunlap's Improved ... ⅌ doz $4.00 net
Sammis ... No. 1, $7.50; No. 2, $12.00 ⅌ doz., dis 55 %
Townsend's Patent ... $6.00 ⅌ doz., dis 33⅓ %

Lines.—Linen Fish ... dis 25&10 %
Cotton Chalk ... dis 55 %
Sil. Lake Chalk ... Nos. 0, 1, 2, 3, $6.00, $6.50, $7.00, $7.50 ... dis 15&10 %
Mason's Linen ... dis 25&10 %
Wire Clothes, Galvanized ... each 30 @ 40c net

Locks and Latches.
Cabinet—Eagle / " Gaylord / " Bridgeport } Reduction in list of some numbers March 1, 1879. ... dis 25&2 %
" Barnes & Deitz ... dis 30 %
Trunk ... dis 25 %
Langstroth & Crane's List Jan. 1, '77.
Round Key ... dis 40&10 %
Flat Key ... dis 33⅓&10 %
Barnes & Deitz, Flat Key ... dis 30 %
Yale Lock Co., Flat Key ... dis 40 %
Shepardson's, Flat Key ... dis 35 %
American Lock Mfg. Co ... dis 33⅓ %
Plate ... dis 33⅓ &5&2 %
F. Many's "Extension Cylinder" ... $10.50 ⅌ doz, net
DOOR LOCKS, &C.
Branford ... dis 60&10&2 %
Norwalk ... dis 50&10&2 %
Norwich ... dis 50&10&2 %
Russell & Erwin ... dis 70&2 %
Mallory, Wheeler & Co ... dis 35&10&2 %
Reading Hardware Co ... dis 35&10&2 %
Trenton ... dis 40&5&2 %
Continental ... dis 33⅓ %
Padlocks—Russell & Erwin / " Mallory, Wheeler & Co. / " Wm. Wilcox & Co } ... dis 33⅓&5 % and 2 % for cash
" American Lock Mfg. Co ... dis 33⅓ %
" Romer's ... dis 50 %
" Conestoga ... dis 50 %
" J. H. McWilliams ... dis 10 %
" Barnes & Dietz ... dis 35 %
" Penn Lock Works ... dis 30 %

Mallets.—Hickory and Lignumvitæ ... dis 10&10 %

Meat Cutters.
Dixon's (P. S. & W.) Nos. 1 2 3 4
⅌ doz .. $14.00 17.00 19.00 30.00—dis 25
Miles' Challenge ... Nos. 1 2 3
⅌ doz .. $22.00 30.00 40.00—dis 30 %
Perry's Nos. 1 2 3 4 4 g'rd 5 g'rd
Each ... $3.00 4.00 5.00 11.00 13.00 30.00—dis 40 %
Woodruff's (P. S. & W.) ... Nos. 100 150
⅌ doz .. $15.00 18.00—dis 40 %
Hales' ... Nos. 11 12 13
⅌ doz .. $33.00 40.00 51.00—dis 50&2 %
Draw Cut ... Nos. 5 2 6 8 10
Each .. $50.00 75.00 80.00 225.00 400.00—dis 20 %
American ... dis 25 %
Nos ... 1 2 3 4 B 5
Each ... $5.00 7.00 10.00 25.00 50.00 60.00

Mincing Knives.
Am., 1 blade, $16; 2 blades, $27; 3 blades, $37 per gross ... dis 15@20 %

Molasses Gates.
Stebbins Pattern ... dis 62½&10 %
" Genuine ... dis 62&10 %
" Tinned Ends ... dis 40&10 %
Chase's Hard Metal ... dis 30 %
Bush's ... dis 20 %
Lincoln's Genuine ... dis 62½&10 %
Weed's ... dis 15 %
Nails ... See Trade Report

Nuts and Washers.
Square Nuts ... 7c off list
Hexagon Nuts ... 8c off list
Washers ... 7c off list

Nut Crackers
Table (Humason & Beckley Mfg. Co.) ... dis %
Blake's Pattern ... ⅌ doz $2.00, dis 10 %

Oakum.
Best ... ⅌ ℔ 9½c
U. S. Navy ... ⅌ ℔ 8½c
Navy ... ⅌ ℔ 7c
Oilers.—Zinc and Tin ... dis 55&10 %
Brass and Copper ... dis 55 %
Olmsted's ... dis 45&10 %
Broughton's ... dis 40 %
Malleable (Hammer's) ... ⅌ doz $5.00, dis 10 %
Prior's Patent or "Paragon," Zinc ... dis 55&10 %
" " Brass ... dis 55 %
Ox Balls ... dis 60&10 %

Pencils.
Faber's Carpenters' ... dis 10 %
" Round Gilt ... ⅌ gross $5.25 net
Dixon's Lead ... ⅌ gross 4.00 net
" Lumber ... ⅌ gross 7.50 net

Packing, Steam.
N. Y. Belting and Packing Co ... new list net

Picture Nails.
Brass Head, Sargent's List ... dis 60&10 %
" T. & S. Mfg. Co ... dis 50 %
Porcelain Head, Sargent's List ... dis 60&10 %
" " Judd's List ... dis 40 %
Porcelain Head, T. & S. Mfg. Co ... dis 40 %
Pinking Irons ... ⅌ doz 75c, net

Plaiting Machines.
Magic ... ⅌ doz $10.00, net
Astor Plaiting Machine ... each $15.00, dis 20 %
Crown Plaiting Machines ... dis 25 %
6in., $6.00. 10in., $10.00, each.

Planes and Plane Irons.
Bench, First Quality ... dis 35&10 %
" Second " ... dis 50&10
Moulding ... dis 35&10 %
Bailey's (Stanley R. & L. Co.) new list Jan. '79. dis 35&10 %
The Stanley (S. R. & L. Co.) " " dis 25&10 %
Bailey's "Victor" ... dis 25&10 %
Defiance Adjustable, new list ... dis 25&10 %
Plane Irons, Butcher's ... $5.50 to £
" Buck Bros ... $5.00 to £
" Auburn Tool Co.'s ... dis 25 %
" Defiance ... dis 25&10 %
" Middletown Tool Co ... dis 10 %
" Ohio Tool Co ... dis 20&10 %
" Spear & Jackson's ... $5.00 to £
" Sandusky Tool Co ... dis 10&10&10 %

Pliers and Nippers.
Button's Patent ... dis 33⅓ %
Hull's Patent Nippers, No. 1, $15; No. 2, $21 ⅌ doz, dis 25 %
Humason & Beckley Mfg. Co ... dis 33⅓ %
Gas Pliers ... dis 45 %
Eureka Pliers and Nippers ... dis 25 %
Russell's Parallel ... dis 25 %
P. S. & W. Cast Steel ... dis 15 %
" " End Cutting Nippers ... dis 25 %
" Tinners' Cutting Nippers ... dis 20 %

Plumbs and Levels.
Disston's ... dis 70 %
Stanley R. & L. Co.'s Pat. Adjustable ... dis 65&10 %
" " " Non-Adjustable ... dis 65&10 %
Chapin's Patent Adjustable ... dis 65&10 %
" Non-Adjustable ... dis 65&10 %
Standard Rule Co.'s New Adjustable ... dis 60&10 %
" " Non-Adjustable ... dis 60&10 %
Johnson's Patent Adjustable ... dis 60&10 %
Davis' Patent ... dis 60&10 %
Pocket Levels ... dis 65&10 %

Post Hole and Tree Augers.
Samson Post Hole Digger ... per doz $36.00, dis 20 %
Fletcher Post Hole Augers ... ⅌ doz 36.00, dis 20 %
Vaughan's Post Hole—
6 in. $23.60; 7, 8 and 9 in. $25 per doz ... dis 20 %
Leed's ... $5.00 each, dis 45 %
Eureka ... ⅌ doz $40.00, dis 40 %

Potato Parers, &c.
Bay State ... ⅌ doz $13.00 dis 10 %
Saratoga "Peeler and Slicer ... ⅌ doz 7.75 dis 10 %

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw per doz $18.00, dis 20 %
" Pruning Hook ... " 11.50, dis 20 %
Pruning Shears ... ⅌ doz $4.50@$5.00 net

Pulleys.
Judd's Axle ... ⅌ doz $0.50, dis 40 %
Hot House and Tackle ... dis 70&10 %
Jap'd Screw ... dis 70&10 %
Brass Screw ... dis 60&10&10 %
Jap'd Side ... dis 70&10 %
" Clothes Line ... dis 70&10 %
Hay Fork Solid Eye, $4.50; Swivel, $5.00, dis 10&10&10 %
" " "Anti-Friction," ... $7.50 dis 20 %
" " "F" Common and Pat. Bushed ... dis 20 %
" " Tarbox Pat. Iron ... dis 30 %
Shade Rack ... dis 50 %

Punches.
Belt or Drive ... ⅌ doz $2.00; 2.25; 2.50, dis 45 %
Bemis & Call Co.'s Cast Steel Drive ... dis 40&30 %
" " Springfield Socket ... dis 50&10 %
Spring ... ⅌ doz $7.00, dis 50 %
" Leach's Patent ... dis 15 %
Bemis & Call Co.'s Spring and Check ... dis 50 %
Solid, Tinners' ... ⅌ doz $1.44, dis 35@10 %

Rail.
Sliding Door Wrought Brass ... ⅌ ℔ 35c dis 10&10 %
" " Iron, Painted ... ⅌ foot 9c, dis 60 %
Barn Door, ½, ⅝ and ¾ inch ... dis 75&10 %
" for N. E. Hanger ... dis 70&10 %

Rakes.
Cast Steel ... dis 15 %
8 10 12 14 16 teeth.
$5.00 5.75 6.50 7.25 8.00
Malleable ... dis 15 %
10 12 14 teeth.
$3.60 4.00 4.40

Razor Straps.
Genuine Emerson ... dis 33⅓ %
Badger's Emerson ... dis 33⅓ %
Badger's (not Emerson) ... dis 25 %
Evans' ... dis 40 %
Imitation Emerson ... ⅌ doz $2.75, dis 40&10 %
Hunt's ... dis 40&5 %
Chapman ... dis 15 @ 20 %
Torrey's ... dis 25 %
Saunders ... dis 15 @ 20 %

Rivets.
Iron and Tinned ... dis 50 %
In bulk, new list of Jan. 10, 1878 ... dis 35 %
Copper Rivets and Burs ... dis 50 %
Nos ... 7 8 9 10 11 12 13 14 15
⅌ ℔ ... 49c 50c 52c 54c 56c 58c 60c 64c 70c
Tinned Iron Belt Rivets and Burs ... dis 35 %
Rivet Sets ... dis 35&10 %

Rods.
Stair ... New list, March 1, '79, dis 33⅓ %
" American Patent ... dis 40 %

Rollers.
Barn Door, Sargent's list ... dis 70&5&10 %
Novelty ... dis 40 %
Acme (Anti-Friction) ... dis 40 %

Rope. Manufacturers' Net List, December, 1878.
Manila ... ½ inch and larger ⅌ ℔ 11¼c
" ... ⅜ inch ⅌ ℔ 11¾c
" ... ¼ and 5-16 inch ⅌ ℔ 12¼c
" Tar'd Rope ... ⅌ ℔ 10¼c
" " Lath Yarn ... ⅌ ℔ 12¼c
" Hay Rope ... ⅌ ℔ 11¼c
Sisal ... ½ inch and larger ⅌ ℔ 9¼c
" ... ⅜ inch ⅌ ℔ 9¾c
" ... ¼ and 5-16 inch ⅌ ℔ 10¼c
" Hay Rope ... ⅌ ℔ 9¼c

Rules. Boxwood. Ivory.
Chapin's / Standard / Willis, Thrall & Son / Stephens / Stanley } dis 70 &10 % } dis 60 &10 %

Sad Irons.
From 4 to 10 lbs ... ⅌ ℔ 2¾c net
Self-Heating ... ⅌ doz $8.75 net
" Tailors' ... ⅌ doz $18.50 net
Gleason's Shield and Toilet ... dis 25 %
Enterprise Patent Cold Handle ... dis 33⅓ %
Mrs. Pott's Pat. Cold Handle, "Crown" ... dis 33⅓ %
Combined Fluter and Sad Iron .. per doz $15.00, dis 15 %

Sand Paper.
Baeder & Adamson's Flint, 00 to 1½ .. $4.25 ⅌ ream }
" " " 2, 2½ & 3. 4.75 ⅌ ream }
" " " Assorted 4.25 ⅌ ream } dis 20 %
" " Star ... 3.25 ⅌ ream }
" " Emery .. ⅌ ream $6.50 @ 11.50 }
New England, same list as B. & A. Flint ... dis 20 %
Gage's ... dis 20&5 %

Sash Cord.
Common ... ⅌ ℔ 16 @ 15c net
Patent ... ⅌ ℔ 18c net
Silver Lake Russia Flax ... ⅌ ℔ 55c net
" White Cotton ... ⅌ ℔ 55c net
" Drab Cotton ... ⅌ ℔ 60c net
Raw Hide ... dis 25 %
Steel Ribbon ... dis 10 %

Sash Locks.
Clark's, No. 1, $10.00; No. 2, $8.00 per gross ... dis 45@50 %
Ferguson's ... dis 33⅓ %
Walker's ... dis 10 %
Hammond's Window Springs ... dis 25 %
Northup Window Springs ... $9.00 per gross, dis 10 %
The Perfect, Clark & Smith, Plain Jap'd ⅌ gro $10.00 net
" " Por. Knob Jap'd ⅌ gro 14.00 net
" " Nickel-Plated ... ⅌ gro 27.00 net
Sash Weights.—Solid Eyes ... ⅌ ℔ 1 @ 1¼c

Sausage Stuffers or Fillers.
Miles ... ⅌ doz $20, dis 30 %
Perry ... ⅌ doz, No. 1, $15; No. 0, $21, dis 40 %
Draw Cut No. 4 ... each $30.00, dis 20 %
Enterprise Mfg. Co ... dis 30 %
Silver's ... dis 25 %

Saws.
Disston's Circular ... dis 35 %
" Mill ... dis 20 %
" Cross Cut ... dis 20 %
" Hand, Panel, Rip, &c ... dis 20 %
Boynton's Lightning, Cross Cuts, new list ... dis 30 %
" One-Man, all lengths ... dis 25 %
" Billet Webs, 30 in ... ⅌ doz $8.00, dis 30 %
Wheeler & Clemson Mfg. Co.'s Hand ... dis 20 %
" " Cross-Cut ... dis 35 %
Livingston's Butcher and Kitchen ... dis 20 %
Framed Wood—
Nos ... 101 102 103 104 105
Per doz .. $10.00 8.[illegible] 10.00 7.50 6.25 net

Saw Frames.
White, Vermont ... ⅌ doz $1.35, dis 25 %
Red, Polished and Varnished ... ⅌ doz $2.00, dis 25 %
Saw Rods ... $10 list dis, 10&10 %

Saw Sets.
Boynton's Patent ... per doz, $10.00, dis 30 %
Stillman's Genuine ... ⅌ doz $3.38@$3.50 net
" Imitation ... ⅌ doz $3.25, dis 35 %

Common Lever......per doz $2.00, dis 25 %
Leech's......No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's......No. 1, $8.50; No. 2, $5.50, dis 20&10 %
Hammer, Hotchkiss......$5.50, dis 10 %
" Bemis & Call Co.'s New Pat......dis 40&5 %
Bemis & Call Co.'s Lever & Spring Hammer.dis 35&10 %
" " Plate and Cross Cut......dis 20 %
Aiken's Genuine......$13.00, dis 50 %
" Imitation......$7.00, dis 55 %
Hart's Patent Lever......dis 20 %
Disston's......dis 20 %

Scales.
Hatch, Counter, No. 171......₩ doz $36, dis 45&10 %
" Tea, No. 161......₩ doz $15.00 dis 55 %
Union Platform......$6.00, dis 55 %
Turnbull's Market......dis 20 %
Fairbanks'......dis 20&5 %
Howe's......dis 20&5 %
Chatillon's Grocers'......dis 40 %
" Eureka......dis 20 %
Family Universal......dis 45 %
" Favorite......dis 40 %
" Turnbull's......dis 25 %
Scale Beams, Chatillon's list......dis 25 %
" Sargent's list......dis 60&10 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.), $6.50 dis 20&10 %
Box, 1 Handle......₩ doz $5.00, dis 12 %
" 2 "......₩ doz 6.00 dis 10 %
Defiance Box and Ship......dis 25&10 %
Foot......dis 70&10 %
Ship (common)......per doz $3.00 net
" (Providence Tool Co......dis 10 %

Screw Drivers.
Bart, Bliven & Mead......dis 45&10&2 %
Douglass Mfg. Co......dis 35&1 %
Disston's......dis 52½ %
Disston's Patent Excelsior......dis 52½ %
Buck Bros......dis 25 %
Stanley Rule & Level Co., Varnished Hdls..dis 50&10 %
" " " Black Handles...dis 40&10 %
Sargent & Co.'s......dis 60&10 %

Screws.
Flat H'd Iron......dis 60 %
Round Head Iron......dis 45 %
Flat Head Brass......dis 45 %
Round Head Brass......dis 30 %
Brass and Silver Capped......dis 40 %
Japanned, list of Plain Screws......dis 55 %
Lag or Common Coach......dis 70&5 %
Coach Patent Gimlet Point, List per 100......dis 65 %
Bed......dis 10@10 %
Machine, Flat Head, Iron, Am. Screw Co......dis 25 %
" Round Head, Iron, "......dis 20 %
Bench, Iron......dis 60&10 %
" Wood, Beech......₩ doz $3.00, dis 10 %
" " Hickory......dis 20&10 %
Hand......dis 25&10 %
Hand Rail, Sargent's......dis 70&10 %
" " Humason, Beckley & Co.'s......dis 40&10 %
Jack (Wilson's)......dis 35 %
Sash (T. & S. Mfg. Co.)......dis 25 %

Shears and Scissors.
Cast Steel......dis 80&10 %
" Iron, "American"......dis 60 %
Seymour's Straight Trimmers......dis 65 %
" Scissors......dis 65 %
Pruning......see Pruning Hooks and Shears.
Barnard's Lamp Trimmers......₩ doz $3.75
Tinners'......dis 20 %
Heinisch Trimmers and Scissors......dis 60 %
" R. H. S. " "......dis 65 %

Sheaves.
Sliding Door, M. W. & Co., list......dis 35&10&2 %
" R. & E. list......dis 50&2 %
" Patent Roller......dis 25&2 %
" " " Hatfield's......dis 50&2 %
" Russell's Anti-Friction......dis 50&2 %
" Moore's Anti-Friction......dis 45 %
Sliding Shutter, R. & E. list......dis 50&2 %
" " Sargent's list......dis 45&10 %
Moore's Anti-Friction (Hanging)......dis 45 %
Philadelphia Hanging......dis 40&5&2 %

Shovels and Spades.
Ames, New list, Jan. 1, '79......dis 20 %
Kimball Shovel Co......dis 20 @ 20&5 %
Old Colony......dis 30 %
Remington's (Lowman's Patent)......dis 30 %
Dunning's Shovels and Scoops......dis 20&7½ %
B. Rowland's "Regular," new list......dis 60 %
" Patent, new list......dis 40&5 %
Oxford Patent, new list......dis 40&5 %

Shovels and Tongs.
Iron and Brass Head, R. & E. list......dis 50&2 %
" " Hart's......dis 50&10&2 %
Polished Steel......new list, dis 50&10&2 %

Slates.
Square Frames, Round Cornered, by case......dis 70 %
Less than a case......dis 65&10 %

Spoke Shaves.
Defiance Metallic......new list, dis 25&10 %
Iron......dis 40&10 %
Wood......dis 30 %
Bailey's (Stanley R & L. Co.) new list......dis 25&10 %

Spoke Trimmers.
Bonney's......₩ doz $10.00, dis 40 %
Stearn's......₩ doz $10.00, dis 40 %
Ives'......No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 50&10 %
Douglass'......₩ doz $9.00, dis 20&10 %

Spoons.
Tinned Iron......dis 40&5 %
Basting......dis 40&5 %
Britannia......dis 65&10 %
Derby Silver Co......dis 40&5&5 %
L Boardman's Sons, A1......dis 40&5&5 %
Rogers & Bro., A 1......dis 40&5 % cash
Rogers Cutlery Co......dis 40&5&5 %
Reed & Barton......dis 40&5 %
Hall & Elton......dis 40&5 %
Holmes, Booth & Haydens......dis 40&5 %
German Silver......dis 30&10&5 %
Diamond Steel (L. Boardman's Sons)......dis 30&5 %
Tin (P. S. & W.), Teas......$1.50 ₩ gross, net
" " Tables......$2.50 ₩ gross, net
Tin Cowles Hdw. Co.)......dis 10 %
" " " case lots......dis 20 %

Stocks and Dies.
"Lightning" Screw Plate......dis. 10 %

Stone.
Hindostan Stone......₩ ℔ 6c } dis 30&10 %
" Ax Stone......₩ ℔ 8c
" Slips......₩ ℔ 10c
Sand Stone......₩ ℔ 6c, dis 30&10 %
Washita Stone......No 1, ₩ ℔ 20c net
" "......No 2, ₩ ℔ 15c net
" Slips......No. 1, ₩ ℔ 45c net
Turkey Oil Stone (Boyd & Chase)....4 to 8in, $1.00 ₩ ℔, dis 10 %
" Slips "......$2.50 ₩ ℔, dis 10 %
Lake Superior (Boyd & Chase)......₩ ℔ 20c, dis 10&5 %
" " Slips......₩ ℔ 45c, dis 10&5 %
Grindstones, Family, Loring's......dis 10 %

Stove Polish.
Joseph Dixon's......₩ gross $6.00, dis 5 %
Gem......₩ gross $4.50, dis 5 %
Gold Medal......₩ gross $6.00, dis 25 %
"Mirror"......₩ gross $6.00, dis 5 %
Ruby......₩ gross $3.75, net
Rising Sun......₩ gross $5.75, net
Dixon's Plumbago......₩ ℔ 8c. net

Squares.
Steel......dis 50 %; full cases, dis 50&10 % } 2 % cash
Iron......dis 50 %; full cases, dis 50&10 %
Nickel Plated......add $2.50 @ $4.00 ₩ doz, net
Try Squares and T Bevels......dis 50&10 %
Star Try Squares and Bevels......dis 35 %
Disston's Try Squares and T Bevels......dis 52½ %
Winterbottom's Try and Mitre......dis 25&10 %
Bailey's Try Squares and T Bevels......dis 25&10 %

Tacks, Brads, &c.
List of May, 1878......dis 55 %
Shoe Nails, (new list)......dis 10 %
Double-Pointed Tacks......dis 40&5 %

Tap Borers.
Common and Ring......dis 20&10 %
Ives' Tap Borers......dis 10&10 %
Enterprise Mfg. Co......dis 20 %

Tapes, Measuring.
American......dis 25 %
Spring Tapes......dis 25&10 %

Thermometers.
Tin Case......dis 70 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion)......dis 20 %
Wood Bottom......₩ doz $12.00, dis 40@45 %
All Iron......₩ doz $10.50, dis 50&5 %
Nashua Lock Co.'s......₩ doz $18.00, dis 50 %
Toe Calks.—Winsted......₩ ℔ 10c. dis 10 %

Tinners' Tools and Machines.
Machines (P. S. & W.)......dis 5@10 %
Tools (P. S. & W.)......dis 15@20 %

Traps.
Game, Newhouse......dis 33⅓ %
" Newhouse Pattern......dis 60&10 %
" Blake's Patent......dis 40&10 %
Mouse, Wood, Choker......₩ doz holes, 12 @ 13c
" Round Wire......₩ doz $1.50, dis 10 %
" Cage "......₩ doz $2.50, dis 10 %
" Patent Self Setting......₩ doz holes, 25c, net
" Catch-em-alive......₩ doz $2.75, dis 10 %
Rat. "Decoy"......per doz $10.00, dis 10 %

Trowels.
Lothrops Brick and Plastering......dis 15 @ 10%
Reed's Brick and Plastering......dis 15 %
Disston's Brick and Plastering......dis 20 %
Peace's Plastering......dis 20 %
Clement & Maynard's......dis 20 %
Rose's Brick......dis 15 %
Brades' Brick......dis 20 %
Worrall's Brick and Plastering......dis 20 %
Garden......dis 50 %

Triers.
Butter and Cheese......dis 25%

Vises.
Solid Box, Trenton...New List, Jan. 22, '79, dis 35
" Wilsons......New List, Jan. 22, '79, dis 35 %
" "Crown" (A. H. Hildick's) 40 to 100 lbs., 15c currency......dis 20 %
" Park, Long & Co., new list Jan. 22, '79, dis 35 %
" Peter Wrights......15½c
Parallel, Parker's......dis 20 %
" Wilson's......dis 45 @ 50 %
" Howard's......dis 25 %
" Merrill's......dis 20 %
" Sargent's......dis 66⅔&10 %
" Trenton......dis 25 %
" Backus and Union......dis 25 %
" Fisher & Norris......dis 15&10 %
" Stevens'......dis 25 %
" Simpson's Adjustable......dis 25&10 %
"Family," List......net
Saw Filers, Bonney's......₩ doz $24.00, dis 20&10 %
" Stearn's......dis 20&10 %
" Hopkins'......₩ doz $17.50 dis 10 %
Lowell Hand Vises......dis 20 %
Richardson's Vise and Anvil......dis 25 %

Ventilators.
Protective (upper) per foot, $2.00......} dis 35 %
" (lower) " 1.50

Washer Cutters.
Smith's Patent......₩ doz $12.00 dis 10 %
Johnson's......₩ doz $12.00. dis 33⅓ %

Penny's......₩ doz $14.00 and $16.00, dis 45 %
Appleton's......₩ doz $8.00, dis 20&10 %

Washers.—See Nuts and Washers.

Weather Strips.
Protective Ventilator Co. s......dis 25 %

Well Wheels.—Revised list......dis 60&10 %

Wire.
Brass and Copper......List of July 1, 1878 dis 15&10 %
Bright and Annealed......Nos. 0 @ 18, dis 57½ @ 60 %
" "......Nos. 19 @ 26, dis 62½ @ 65 %
" "......Nos. 27 @ 36, dis 65 @ 67½ %
Coppered......Nos. 0 @ 18. dis 52½ @ 55 %
Galvanized, Nos. 0 to 6......₩ ℔ 10c, dis 37½ @ 40 %
" Nos. 7 to 18......market list, dis 37½ @ 40 %
Tinned, Nos. 0 to 18......dis 42½ @ 47½ %
Cast Steel......dis 25 @ 30 %
Tinned Broom Wire, Nos. 18 to 25......dis 57½ @ 60 %
Annealed Fence, Nos. 8 and 9......dis 60 @ 62½ %
" Grape, Nos. 10 to 14......dis 60 @ 62½ %
Galvanized Telegraph, Nos. 7 to 9......₩ ℔ 8½c
" " Nos. 10 and 11......₩ ℔ 9½c
" " No. 12......₩ ℔ 10c
Fence Staples......₩ ℔ 6 @ 6½c
" Staples, Galvanized......9......₩ ℔ 7 @ 7½ c
Stubs Steel Wire......$7.00 to £ gold
Japanned Barb Fence......₩ ℔ 13c
Galvanized "......₩ ℔ 14c
Steel Music Wire, Nos. 12 to 27......₩ ℔ $1.00, net
Judd's Picture Wire......dis 80&20&10 %
Clothes Line Wire, Galvanized......₩ coil 30 @ 40c net
Green Wire Cloth, per sq. foot, 3½c......dis 10 %

Wrenches.
American Adjustable......dis 45 %
Baxter's Adjustable "S,"......dis 20 %
" Diagonal......dis 20 %
Collins & Co.'s......dis 45 %
Coes' Genuine......dis 60&10&10 %
" Pattern (Wrought)......dis 70 %
" " (Malleable)......dis 75&10 %
L. Coes' "Mechanics"......dis 60&10&10 %
Girard......dis 60&10&5 %
Davis' Patent Duplex......new list, dis 25 %
Bemis & Call's Patent Combination......dis 25 %
" " Merrick's Pattern......dis 40&5 %
" " Briggs' Pattern......dis 35 %
" " Cylinder or Gas Pipe......dis 25&30 %
Aiken Pocket (Bright)......$8.00, dis 55&10 %
The Favorite Pocket (Bright)......per doz $8, dis 60 %
Webster's Pat. Combination......dis 35 %

Wringers. Per doz.
Universal, Cog Wheels, No. 2½......$60.00
" " " No. 2......63.00
" " " No. 1½......71.00
Crown No. 2......54.00
" No. 2½......63.00
" No. 3......69.00
Eureka, No. 1......57.00
Novelty, No. 10, with Cog Wheels......60.00
" No. 2, " "......63.00
Excelsior, No. A, with Folding Bench......78.00
" No. E, for Set Tubs......66.00
Keystone No. 1, Wood Frame, no Gear......54.00
" No. 2, Iron " "......54.00
" No. 10. Wood " Common Gear......60.00
Peerless, No. 0, no Cogs......51.00
" No. 1, "......54.00
" No. 2½, with Cogs......60.00
" No. 2, "......63.00
" No. 3, "......71.00
" No. 4, "......93.00
Unique, No. 0......51.00
" No. 1......54.00

Stamped Tinware.—New List Dec. 1, 1878.
Common Stamped Ware......dis 25 %
Stamped Deep and Retinned Ware......dis 25 %

METALS.

IRON.—Duty: Bars, 1 to 1½c. ₩ ℔; Sheet, Band Hoop and Scroll, 1¼ to 1¾c. ₩ ℔; provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 ₩ ton; Polished Sheet, 3c. ₩ ℔; Wrought Scrap, $8 ₩ ton; Cast Scrap, $6 per ton. Railroad, 70c. ₩ 100 ℔s. Boiler and Plate, 1¼c. ₩ ℔.

Pig Iron—AMERICAN.
Foundry No. 1......₩ ton $18.00 @ 19.00
" No. 2......₩ ton 17.00 @ 18.00
Gray Forge......₩ ton 16.50 @

SCOTCH.
Eglinton......₩ ton 19.50 @ 20.00
Coltness......₩ ton 22.00

Rails.
Iron, at mill......₩ ton $32.00 @ 36.00
Steel......₩ ton 43.00 @ 44.00
Old Rails......₩ ton 20.00 @ 21.00

Scrap.
Wrought Scrap, from yard..₩ ton. nom. 24.00 @ 25.00

Bar Iron, from Store.
Common Iron:
¾ to 2 in. round and square......} ₩ ℔ 1 75c
1 to 6 in. x⅜ to 1 in......}
Refined Iron:
¾ to 2 in. round and square......} ₩ ℔ 2.0c
1 to 6 in. x⅜ to 1 in......}
1 to 6 in. x¼ and 5-16......₩ ℔ 2.2c
Rods—⅝ and 11-16 round and square......₩ ℔ 2.1c
Bands—1 to 6x3-16 to No. 12......₩ ℔ 2.4c
Swedish Iron:
Ordinary sizes......97

Sheet Iron.

	Common American	R. G. American.
Nos. 10 to 20	₩ ℔ 2½c	3⅛
21 to 24	₩ ℔ 3c	3¾
25 to 26	₩ ℔ 3¼c	4
27	₩ ℔ 3⅜c	4¼
28	₩ ℔ 3½c	4½c

Galvanized, 14 to 20, B. B. ₩ ℔ 6¾c; 2d qual. ₩ ℔ 6¼c
" 21 to 24, " ₩ ℔ 7¼c; " ₩ ℔ 6 c
" 25 to 26, " ₩ ℔ 7¾c; " ₩ ℔ 6½c
" 27 " ₩ ℔ 8¼c; " ₩ ℔ 7 c
" 28 " ₩ ℔ 9 c; " ₩ ℔ 7½c
Patent Planished......₩ ℔ A. 10c; B, 9c
Russia......₩ ℔ Nos. 8 to 14. 11½@12c
American Cold Rolled......₩ ℔ 4½c

COPPER.—Duty: Pig, Bar and Ingot, 5c; Old Copper 4c ℔; Manufactured (including all article of which Copper is a component of chief value), 45 % ad valorem.
American Ingot......₩ ℔ See Trade Report.

SHEATHING, BRAZIERS' COPPER, BOLTS, &C.
Braziers' Copper, ordinary sizes, over 16 oz., ₩ sq. ft......₩ ℔ 26c
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., ₩ sq. ft......₩ ℔ 27c
Braziers Copper 10 oz and 12 oz., ₩ sq. ft......₩ ℔ 29c
" Lighter than 10 oz. ₩ sq. ft...₩ ℔ 31c
Circles less than 84 in. in diameter......₩ ℔ 28c
Circles 84 in. diameter and over......₩ ℔ 31c
Segment and Pattern Sheets......₩ ℔ 27c
Locomotive Fire Box Sheets......₩ ℔ 26c
Sheathing Copper, over 12 oz. ₩ sq. ft......₩ ℔ 25c
Bolt Copper......₩ ℔ 26c
Copper Bottoms......₩ ℔ 26c
No Copper is Sheathing except 14x48 inches and not to exceed 34 oz. to the sq. ft.

TINNING.
14x48, by the case......₩ sheet 6c
14x48, less than case......₩ sheet 8c
For tinning both sides, double the above amount

O'NEILL'S PATENT PLANISHED COPPER.—Net.
14x48.
14 and 16 oz. and heavier..₩ ℔ 31c By the case. ₩ ℔ 30c
12 oz. and lighter......₩ ℔ 34c " " ₩ ℔ 33c

Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x60.
14 and 16 oz. and heavier. ₩ ℔ 33c By the case. ₩ ℔ 32c
(And all sizes not over 20 in. wide.)

30x60.
14 and 16 oz. and heavier......₩ ℔ 35c
12 oz......₩ ℔ 38c

Brass.
Brown & Sharp's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

BRASS MANUFACTURERS' PRICE LIST.—dis nominal. July 1, 1878.

Cash prices for Roll and Sheet Brass. For less quantity than 100 ℔s. add 3c ₩ ℔.

HIGH BRASS.
All Nos. not thinner than to No. 28, wider than 2 in., not wider than 14 in......25c
All Nos. to No. 28, inclusive, and widths over 14 to 20 in., inclusive......30c
All Nos. to No. 28, inclusive, and widths over 20 to 30 in., inclusive......33c
½c. ₩ ℔ advance on each No. above Nos. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass, at...48c
Sheets 24x48, and all sheets cut to particular sizes and lengths under 30 in., in width wider than 2 in. 32c
Printers' Rules......40c
Sheets wider than 30 in. and under 40 in......42c
" 40 in. and over......45c
Circular Sheets, in diam. from 4 in. to 14, inclusive.35c
" " over 14 " 20, " ..40c
" " " 20 " 30, " ..44c
" " " 30 " 40, " ..50c
" " " 40 in......54c

LOW BRASS.
4c ₩ ℔ more than High Brass.
Gilding Metal, 8c ₩ ℔ more than High Brass.
Platers' or Gold Metal { In Bars......43c
{ Sawed......40c
{ Planed or Polished......49c

FOR SLITTING.
Metal in width 2 in. to ½ in. to No. 28, inclusive, 1c. ₩ ℔ advance.
Metal, in width 2 in to 1 in., thinner than No. 28, 2c. ₩ ℔ advance.
Metal, in width 1 in. to ½ thinner than No. 28, 3c ₩ ℔ advance
Metal, in width ½ in. to ¼, inclusive, not thinner than No. 28, 2c. ₩ ℔ advance.
Metal, in width ½ in. to ¼ thinner than No. 28, 5c. ₩ ℔ advance.
Metal, ¼ in. in width and less, 10c. ₩ ℔ advance.
Any of the above widths cut to particular lengths, add 7c. ₩ ℔.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire.
4 per cent., 12 inch, to No. 26	$0.52	$0.70
6 " " "	56	76
10 " " " "	64	.88
15 " " " "	.74	1.03
18 " " " "	.80	1.12

German Silver Sheets over 12in. wide and weighing more than 10 ℔s., $2.00 ₩ ℔.
Advance 2c. for each additional inch in width above 12 in., and 2c. ₩ ℔ on each No. thinner than Nos. 26 to 36, inclusive
All German Silver thinner than No. 36 is Platers, at 50c ₩ ℔ additional.
German Silver Scrap one-half less than net price of 12 in. Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.

BRASS AND COPPER WIRE.

	High Brass.	Low Brass.	Gild'g and Copper.
No. 0 to 20	$0.28	0.32	$0.38

No. 21	.31	$ .35	.41
No. 22	.32	.36	.42
No. 23	.33	.37	.43
No. 24	.36	.39	.46
No. 25	.38	.42	.48
No. 26	.40	.44	.50
No. 27	.43	.47	.53
No. 28	.47	.51	.58
No. 29	.50	.54	.61
No. 30	.53	.57	.67
No. 31	.57	.61	.73
No. 32	.61	.65	.79
No. 33	.65	.69	.88
No. 34	.69	.73	.98

Spring Wire 2c ₩ ℔ advance.
Flat, Square and Half Round Wire 5c ₩ ℔ advance on Round Wire.
Fancy Wire not less than 10c ₩ ℔ advance of Round Wire.
Brass Rods, No. 8 and larger not less than 2 feet lengths, 33c.
Wire straightened and cut, smaller than No. 8, and not less than 2 feet lengths, 38c.
Wire and Rods less than 2 feet lengths, special rates.
Twelve cents per ℔ extra for spooling on 1 ℔ spools.

MISCELLANEOUS.
Common Plain Brass Pail Ears......$0.36
Brass Door Rail......38

SCRAP.—net.
High Brass Scrap......21c
Low "......18c
Gilding......25c
Turnings, Filings and Chips half the price of Scrap.
Terms—Net cash. Interest to be added after thirty days.

TUBING.—dis 10 % ₩ ℔
Plain to No. 20 inclusive, above ¼ in. to 3 in......$0.38
" above 3 in......48
Nos. 21, 22, 23, two cents advance on List for each Number.
Nos. 24, 25, 26, four cents advance on List for each Number.
Above No. 26, special rates.
Plain, ¼ inch......65
" 3-16 "......1.05
" ⅛ "......1.65
All Mandrel Drawn Tubes, 5 cents advance on List Prices.
Fancy Tubing to No. 20......45c
English, Scotch and Extra Patterns Fancy Tubing to No. 20......50
Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on List.
Add to 2 cents ½ cent for each additional cutting under 2 feet.
All Mandrel Drawn Tubes under ⅛ in., 25 cents per pound advance.

ZINC TUBING.—net.
Plain......22
Fancy......28
Scotch and Extra Patterns......31

GERMAN SILVER TUBING.—dis 10 %
4 Per cent......75
6 "......85
9 "......1.00
12 "......1.15
15 "......1.20
16 "......1.35
18 "......1.45
20 "......1.55

STEEL.—Duty: Bars, Ingots, Sheets and Coils, valued at 7 cents ₩ ℔., or under, 2¼ cents; over, 7 cents, and not above 11, 3 cents ₩ ℔; over 11, 3½ cents ₩ ℔, and 10 % ad val. Railway Bars, 1¼ cents ₩ ℔. Railway Bars, in part Steel, 1 cent ₩ ℔. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.
Tool......15c
Spring......7c
Homogeneous......12½c
Boiler Plate......8c
Tire......5½c
Machinery (round and square)......9c
File......9c
Sheet......11 @ 18c
Saw Plate, mill and mulay......14 @ 16½c
" gang and X cut......13 @ 14c
" circular as to size......18 @ 30c

Chrome Steel.
Tool......₩ ℔ 14 @ 15c
Tool, extra fine......₩ ℔ 40 @ 75c
Spring......₩ ℔ 8 @ 9c
Machinery......₩ ℔ 8 @ 10c
Gun or Homogeneous......₩ ℔ 12 @ 16c

English Steel.—
" Best Cast......₩ ℔ 15½c
" Extra Cast......₩ ℔ 16½c
" Round Machinery, Cast......₩ ℔ 10c
" Swaged, Cast......₩ ℔ 18c
" Best Double Shear......₩ ℔ 15½c
" Blister, 1st quality......₩ ℔ 13c
German Steel, Best......₩ ℔ 11c
" 2d quality......₩ ℔ 10c
" 3d quality......₩ ℔ 9c
Sheet Cast Steel, 1st quality......₩ ℔ 15½c
" 2d quality......₩ ℔ 14½c
3d quality......₩ ℔ 12½c

ANTIMONY......12 to 12½
LEAD.—Duty: Pig $2 ₩ 100 ℔s; old Lead, 1½c ℔ ₩ Pipe and Sheet, 2½c ₩ ℔.
American......3½c
Bar......4½c. dis 10 %
Pipe......5c. dis 10 %
Tin Lined Pipe......12c. dis 10 %
Sheet......6c, dis 10 %
Shot......Drop 6½c, Buck, 7½, dis 10 %
Chilled Shot......8c, dis 10 %

BABBITT METAL.
N. P. U......₩ ℔ 6 @ 7c
A 20c; B, 16c; C, 12c: D 10c ₩ ℔.

TIN.—Duty: Plates, Sheets, Tagger and Terne, 1.1c ₩ ℔; Electro-galvanized Plates, 2c ₩ ℔; Manufactures of, not enumerated, 35 per cent. ad. val. Bars, Block and Pigs free. Banca, subject to duty of 10 per cent
Banca......₩ ℔ 19c
Straits......₩ ℔ 16@16½
English......₩ ℔ 16

TIN PLATES.
I C 10x14 / 14x20 } Prime Charcoal......$6.50 @ 6.75
I C 12x12 "......6.75 @ 7.00
X 10x14 / 14x20 } Prime Charcoal......8.50 @ 8.75
I X 12x12 "......8.75 @ 9.00
D C 12½x17 "......6.00 @ 6.25
D X 12½x17 "......8.00 @ 8.25
For each additional X add......2.00

COKE TIN PLATE.

	Best.	2d quality.	Ordinary.
I C 10x14 / I C 14x20	$6.00	5.75	5.25 @ 5.50
I C 12x12	6.25	6.00	5.50 @ 5.75

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$6.00	5.50 @ 5.75	5.00 @ 5.25
I X 14x20	@ 8.00	....	....
I C 20x28	12.25 @ 12.50	11.75 @ 12.00	10.50 @ 11.50
I X 20x28	@ 16.00	....	....
I C 20x200	@ 18.75	....	....

I C 14x20 M. F. Brand......$7.50 to $7.75
SOLDER......No. 1. 9½c @ 10½c No. 2. 9c
SPELTER.—Duty: in Pigs, Bars and Plates, $1 ₩ 100 ℔s.
American, cash......5¼ @ 5½c
Bergen Port from Lehigh Ore......9c
Lehigh, on spot......9c
ZINC.—Duty: Pig or Block, 1.50 ₩ 100 ℔s. Sheet, 2½c ₩ ℔.
Sheet, Cask......6¼@6½c
" Open......7c

Paper Stock, Old Metals, &c

(Dealer's Selling Price.)

Canvas linen......4 @
White cotton, new......5½ @
" " No 2...... @
White linen rags, No. 1......4 @
" " No. 2......2½ @ 2¾
Seconds......1¾ @ 2
Mixed woolens......2½ @ 3¼
Soft woolens......8½ @
Gunny bagging......3⅜ @
Jute Butts......3 @ 3¼
Kentucky bagging......4½ @
Waste paper and scraps...... @ 1
Rope cuttings......1½ @ 3
Kentucky bale rope......4 @ 4¼
Grass rope...... @ 2¾
Tarred shaking......1½ @
White collar cuttings, all paper......7 @
" " " muslin lined......5 @
" " Envelope......7 @
Hard White Shavings, No. 1......3½ @
Soft " " No. 1......3 @
White Shavings, No. 2......2¾ @
Mixed Shavings, part white......2¼ @
Imperfections, No. 2, best folded sheets......3¼ @
" No. 1. Heavy Stock......3½ @
Book Stock......3 @
" " Heavy......3 @
" " Light......1½ @
Newspapers......1¾ @ 2
Prints......1¾ @
Pure Manilas......2¾ @ 1½
Bogus Manilas and Hardwares......¾ @ 1
Commons......50 @
Binders' Board Cuttings......1 @
Straw Board Cuttings......¾ @
Woolen Tailor Clips......13 @ 14
Satinet "......2 @ 2½

Old Metal.
Copper, heavy......14½ @
Copper Bottoms...... 11
Yellow Metal......10 @
Brass, light......8 @
" heavy......10 @
Heavy Composition......13 @
Old Lead, solid......2¾ @
Tea Lead......2½ @
Zinc......3⅜ @ 3½
Pewter, No 1......11 @
" No. 2......9 @
Wrought Iron......per ton $20.00
Machinery Iron......per ton 13.00
Light Iron......per ton 10.50
Stove Plate......per ton 11.00
Grate Bars......per ton 4.50

Paints, Oils, &c.

Paints.
Black Lamp, Coach Painters......₩ ℔ 20c
" " Ordinary......6c
" Ivory Drop, fair......12 @ 15c
" " best......23c
Black Paint, in oil......kegs, 8c asst'd cans, 11c
Blue, Prussian, fair to best......40 @ 55c
" " " in oil......[illegible]
Blue Chinese dry......85c
" Ultramarine......18 @ 30c
Brown, Spanish......1½c
" Van Dyke......10@12c
Carmine, 40......combination price
Green, Chrome......15 @ 23c
" " in oil......14 @ 18 @ 25c
" Paris......good, 25c; best, 30c
" " in oil......" 30c; " 45c
Iron Paint, Bright Red......₩ ℔ 2½c
" Red......₩ ℔ 2c
" Brown......₩ ℔ 1½c
" Purple......₩ ℔ 3c
" Ground in Oil, Bright Red......₩ ℔ 5½c
" " " Red......₩ ℔ 5c
" " " Brown......₩ ℔ 4½c
" " " Purple......₩ ℔ 6c
Mineral Paints......1¼ @ 4c
Orange Mineral......11c
Red Lead, American......6½c
" " English......9½c gold
" Venetian (N. C.) dry......$1.65 @ $1.70
" " in oil......asst'd cans, 11c; kegs, 8c
" Indian dry......9 @ 12c
Rose Pink......10 @ 13c
Sienna, American, Raw......4c
" Burnt......4½c
" " in oil......10 @ 16 @ 20c
" Raw " ......11 @ 15 @ 25c
Umber, Burnt......4 @ 8c
" " in oil......9 @ 12 @ 16c
" Raw......3½ @ 7½c
" " in oil......10 @ 16 @ 18c
Vermillion, Chinese......90c, gold
" English......60c, gold
" Trieste......1.10, gold
" American, Common......15c
White Lead, American, pure dry......7 to 8c
" " " in oil......7½c to 8c
White, Paris, English, prime......in bbls. 2 @ 2½c
Yellow Ochre, French......$1.75
" " " in oil...asst'd cans, 11c; kegs, 8c
" " Vermont......in casks 1½c
Yellow Chrome......17 @ 27c
" " in oil......14 @ 18 @ 24c
Zinc White, American No. 1, dry......7c
" " No. 1, in oil......9c
" French (Paris)......8 @ 10c
" " in oil...... @ 10c

Oils.
Linseed, Raw, in casks and bbls......₩ gal. 59c @ 60c
" Boiled. " "......64c @ 65c
Bleached Whale......₩ gal. 52c
" Sperm......₩ gal. 96c
" Elephant......62c
Signal......53c
Prime Lard......54c
No. 1 "......47c
West Virginia......16c @ 22c
Drilling......40c
Empire Cylinder......65c
Miners' Oil......33 to 40c
Fish Oil, pressed......32c
Neatsfoot......70c
Tallow......60c
Machinery......40c
Engine......50c

Glass.
FRENCH WINDOW GLASS.
Prices current per box of 50 feet.

Single Thick.—Discount 60&15&20 %

SIZES.	1st.	2d.	3d.	4th
6 x 8 to 10 x 15	$ 8.00	$ 6.75	$ 6.25	$ 5.75
11 x 14 to 16 x 24	8.75	8.00	7.50	7.00
18 x 22 to 20 x 30	11.25	10.50	9.75	8.75
15 x 36 to 24 x 30	12.75	11.50	10.00	
26 x 28 to 24 x 36	13.50	12.25	11.25	
26 x 36 to 26 x 44	14.75	13.75	11.75	
26 x 46 to 30 x 50	16.25	15.00	13.00	
30 x 52 to 30 x 54	17.25	16.00	13.50	
30 x 56 to 34 x 56	18.75	16.75	15.00	
34 x 58 to 34 x 60	19.50	18.00	16.00	
36 x 60 to 40 x 60	21.00	19.50	18.00	

Double Thick.—Discount 70 to 70&5 %

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$12.00	$11.00	$10.00	$ 9.25
11 x 14 to 16 x 24	14.75	13.75	12.75	11.75
18 x 22 to 20 x 30	19.00	17.75	16.00	
15 x 36 to 24 x 30	21.50	19.25	16.50	
26 x 28 to 24 x 36	23.00	20.75	18.25	
26 x 36 to 26 x 44	25.00	23.00	19.25	
26 x 46 to 30 x 50	27.00	25.00	21.25	
30 x 52 to 30 x 54	28.50	26.00	22.25	
30 x 56 to 34 x 56	30.00	27.75	24.75	
34 x 58 to 34 x 60	31.75	30.00	27.00	
36 x 60 to 40 x 60	35.50	32.50	30.25	

Sizes above 40 x 60—$10.00 per box extra for every five inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket

Sundries.
Asphaltum......08
Benzine......₩ gal. 60
Chalk......⅝c
" Block......⅝c
Dryer, Patent, Am'n......ass't cans, 10½c; keg, 9c
Frostings......50c
Glue, White......33 @ 44c
" Sheet......20c
Glaziers' Points, Zinc......40
Gum, Copal......35c
" Damar......25c
" Shellac, English......30c
" " dark......25c
Litharge, English......9c gold
Mineral Wool......₩ ℔ 1¼ @ 1½c
Pumice Stone, selected Lumps......4 @ 6c
" powdered......2½c
Putty, in bladders......2½c
" in bulk......2c
Rotten Stone, soft, English......8c
Spirits Turpentine......32c
Whiting Spanish......¾

Steel.

R. H. WOLFF & CO.,

IMPORTERS OF

IRON AND STEEL.

Sole Agents for the Sale of the Celebrated

Pr. HOMOGENEOUS DEC.' CAST STEEL, GUN BARRELS, MOULDS AND ORDNANCE.

Sole Agents for **COCKER BROTHERS,** Limited

Successors to SAML. COCKER & SON, (ESTABLISHED 1752.)

SHEFFIELD, ENGLAND.

Sole manufacturers of

'SC' **EXTRA' Cast Steel,**

AND

CAST STEEL WIRE for all purposes.

Sole Makers of

Cocker's "Meteor" Wire Plates.

Railroad Supplies and General Merchants.

Office and Warehouse, 46 Cliff Street, New York

F. W. MOSS,

Successor to JOSHUA MOSS and GAMBLE BROS.

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STEEL AND FILES,

Hammers, Anvils, Vises, Blacksmiths' Tools.

WARRANTED CAST STEEL. Specially adapted for Dies, Punches, Turning Tools, Drills, &c.

ALSO, THE WORLD-RENOWNED

IMPROVED MILD CENTERED CAST STEEL.

Specially adapted for Taps, Reamers, Milling Tools, &c. *Warranted not to crack in hardening Tools of any size.*

SHEET, GERMAN, MACHINERY, SPRING AND EVERY OTHER DESCRIPTION OF STEEL.

Phila.—J. S. Watson & Son, Agents, 512 Commerce St.,

Franklin Works, Wadsley Works, Walkley Works, Sheffield, England.

MILLER, METCALF & PARKIN,

Pittsburgh, Pa.,

Manufacturers of

CRESCENT STEEL,

In Bars, Sheets, Cold-Rolled Strips, &c.

Polished, Compressed Drill Rods and Wire,

Warranted equal to any imported in *quality, finish and accuracy.*

Also Common Grades.

Established 1810.

J. & RILEY CARR,

SHEFFIELD, ENGLAND.

Manufacturers of the "Celebrated

"DOG BRAND" FILES.

Also of Superior

STEEL

For Drills, Cold Chisels, Tools, Taps, Dies, &c.

COLD ROLLED STEEL for Clock Springs, Corsets, &c.

SHEET CAST STEEL for Springs, Saws, Welding and Stamping Cold, &c.

GERMAN, MACHINERY, ENGLISH AND SWEDES SPRING STEEL,

And all other descriptions for machinists and agricultural purposes.

Warehouse, 30 Gold Street, New York.

Near John Street. HENRY MOORE, Agent.

Cleveland Rolling Mill Co.,

Manufacturers of

BESSEMER STEEL

AND

Iron Rail and Fastenings,

SPRING STEEL

AND

WIRE OF ALL KINDS,

Steel Horse Shoes, Tire, Axles and other Forgings,

Boiler Plate, Galvanized and Black Sheet Iron, Corrugated Roofing and Siding of Siemens-Martin, Bessemer Steel and Iron.

All made from our own Lake Superior Ores. *CLEVELAND, OHIO.*

AGENTS FOR THE UNION STEEL SCREW CO.

H. CHISHOLM, President, Cleveland, Ohio.

A. B. STONE, Vice-Pres., No. 52 William St., New York.

CHAMPION **HOG RINGER** RINGS and HOLDER.

Every double Ring ever invented. The only Ring that will effectually keep Hogs from rooting. No sharp points in the nose.

EAGLE BILL **CORN HUSKER** is the best Husker in the market. Farmers say it is the best. Use no other.

BROWN'S **HOG AND PIG** RINGER and RINGS

Only single Ring in the market that closes on the outside of the nose. No sharp points in the nose to keep it sore.

Ringers. 75c. Rings, 50c. 100. Holders, 75c. Huskers, 14c.

CHAMBERS, BERING & QUINLAN, Exclusive Manufacturers, Decatur, Ill.

Wilson Bohannan,

Manufacturer of Patent

BRASS PAD LOCKS

For Railroad Switches, Freight Cars, and the Hardware Trade. All sizes, with Brass and Steel Keys, with and without chains.

Patent Horizontal Rim Cylinder Night Latch.

Self-adjusting to doors of any thickness, with Patent Stop and Drawer Back Knob RIGHT OR LEFT HAND.

PASSENGER CAR LOCKS, Bronzed, Nickel-Plated and Japanned

☞ Catalogues and Samples sent upon application. BROOKLYN, N. Y.

Steel.

SANDERSON BROTHERS & COMP'Y'S BEST REFINED CAST STEEL.

Warranted most superior for TOOLS AND GRANITE ROCK DRILLS.

A full assortment of this universally approved OLD BRAND and other Steels for sale by

FRITH & TILESTON, Agents,

EDWARD FRITH. WM. TILESTON. *No. 16 Cliff Street, NEW YORK.*

LABELLE STEEL WORKS.

SMITH, SUTTON & CO.,

MANUFACTURERS OF ALL KINDS OF

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Also Springs, Axles, Rake Teeth, &c.

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Represented at Boston by WETHERELL BROS., 21 Oliver St.; at Milwaukee by JOHN PRITZLAFF, 43 to 49 West Water St.; at Chicago by S. D. KIMBARK, 80 to 84 Michigan Ave.

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Troy, N. Y.,

Office in New York City, 56 BROADWAY.

MANUFACTURERS OF

Bessemer Railway Steel,

MERCHANT BARS, TIRE AND SHAFTING,

Railroad Iron, Pig Iron, Merchant and Ship Iron,

AGENCIES IN BOSTON AND PHILADELPHIA.

GAUTIER STEEL CO., LIMITED.

D. G. GAUTIER, Chairman, New York. D. J. MORRELL, Treasurer. Johnstown, Pa. CHAS. DOUGLASS, Gen'l Supt. Johnstown, Pa.

STEEL of all kinds.	BRIGHT WIRE
CARRIAGE SPRINGS	ANNEALED WIRE
RAILROAD SPRINGS	COPPERED WIRE
WIRE RODS	GALVANIZED WIRE
FINGER BARS	TINNED WIRE
RAKE TEETH	WIRE FENCE STAPLES

EASTERN OFFICE AND WAREHOUSE: *93 John St., New York City.* WORKS: PHILADELPHIA OFFICE AND WAREHOUSE: *505 Commerce Street.*

JOHNSTOWN, PENN.

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97 John Street, NEW YORK,

Sole Manufact'rs of **"CHOICE"** Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.

CHAS. HUGILL, Agent.

S. & C. WARDLOW,

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Manufacturers of the Celebrated

Cast and Double Shear

STEEL.

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table Knives, Mining Tools, Dies, Files, Clock and other Springs, and Tools of every variety.

Warehouse, 95 John Street, New York.

WILLIAM BROWN, Representative.

Torrey's Patent

COG WHEEL

Ice Cream Freezers.

P. R. DUNNE,

Manufacturer,

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NEW YORK.

Corner Church,

Torrey's Door Springs.

P. R. DUNNE,

Manufacturer,

182 Fulton St.,

NEW YORK.

Steel.

R. MUSHET'S

Special Steel

FOR

LATHES, PLANERS, &c.

Turns out at least double work by increased speed and feed, and cuts harder metals than any other Steel. Neither hardening nor tempering required.

Sole Makers

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Sheffield, England.

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STEELINE.

Used for refining and tempering all kinds of Steel Tools.

Increases their Durability at least five fold.

Secures absolute safety from cracking.

Send for circular to

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GUNPOWDER.

DUPONT'S

Rifle, Sporting and Blasting Powder

The most popular Powder in use.

Dupont's Gunpowder Mills, established in 1801, have maintained their great reputation for 78 years. Manufacture the following celebrated brands of Powder:

DUPONT'S DIAMOND GRAIN,

Nos. 1 (coarse) to 4 (fine), unequaled in strength, quickness and cleanliness; adapted for Glass Ball and Pigeon Shooting.

DUPONT'S EAGLE DUCKING,

Nos. 1 (coarse) to 3 (fine), burning slowly, strong and clean; great penetration; adapted for Glass Ball, Pigeon, Duck and other shooting.

DUPONT'S EAGLE RIFLE,

A quick, strong, clean Powder of very fine grain for Pistol shooting.

DUPONT'S RIFLE, Fg, "Sea Shooting," FFg and FFFg.—The Fg for long range rifle shooting, the FFg and FFFg for general use, burning strong and moist.

Also all kinds of Sporting, Mining, Shipping and Blasting Powders of all sizes and descriptions. Special grades for export. Also, Musket, Cannon, Mortar and Mammoth Powder, U. S. Government standard. Powder manufactured to order of any required grain or proof. Agencies in all cities and principal towns throughout the U. S. Represented by

F. L. KNEELAND, 70 Wall St., N. Y.

N. B.—Use *none* but Dupont's Fg or FFg Powder for long-range Rifle shooting.

GUN POWDER.

Laflin & Rand Powder Co.

No. 26 Murray Street, New York,

Manufacture and sell the following celebrated brands of Sporting Powder known everywhere as

ORANGE LIGHTNING,

ORANGE DUCKING,

ORANGE RIFLE

more popular than any Powder now in use.

Blasting Powder and Electrical Blasting Apparatus.

Military Powder on hand and made to order.

SAFETY FUSE, FRICTIONAL & PLATINUM FUSES.

Pamphlets showing sizes of grain sent free.

Emery, Grindstones, &c.

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GRINDSTONES.

Berea, O., Nova Scotia, & other brands

283 and 285 Front Street, New York.

WORTHINGTON & SONS

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Manufacturers of

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GRINDSTONES.

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The largest manufacturers in the world of

OIL 

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Of all description.

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GRINDSTONES,

33 West and 58 Washington Sts., N. Y.

S. H. JENNINGS, Deep River, Conn., Importer of and Sole Agent in the United States for the HIGHEST GRADE of LONDON GROUND EMERY. Prices low. Do not hesitate to write for information.

Nickel Plating.

EDWARD CARTER,

22 to 40 Spring Avenue, TROY, N. Y

Stove Work a Specialty.

PHILADELPHIA.

(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 60 days. For 6% or 90 days, interest added at 10 per cent. per annum.

Anvils.
Peter Wright's, ₩ lb., gold.....10½c
over 250 lbs.....11c net
Williamson's, ₩ lb., gold.....11c. net
Eagle (American).....9 cents per lb—dis 20%

Apple Parers.— per doz
Reading No. 72.....$ 5 00 net
" " 74.....6 00 net
" " 75.....7 00 net
" " 78.....7 50 net
Peach Parers.....10 00 net
Lit le Favorite, corer and slicer.....7 50 net
Lots of 10 to 25 dozen special price.

Axes.— Per doz.
Mann's Red Warrior.....$ 8 00 @ $ 9 50 net
Red Indian.....8 50 @ 9 00 net
Red Chieftain, bevelled.....8 50 @ 9 00 net
Crown Prince.....8 50 @ 9 00 net

Augers and Auger Bits.— dis 50 @ 55 %
Bates' Nut Augers.....dis 50 @ 55 %
Cook's Augers.....dis 15 %
Watrous' Ship Augers.....dis 40 %
Benjamin Pierce Auger Bitts.....dis 40 %
Griswold Auger Bits.....dis 50 @ 55 %
Cook's " " " .....dis 50 @ 50&5 %
Jennings' " " " .....dis 10&10 %
Bonner's Pat. Hol. Augers, list $48 ₩ doz...dis 25&10 %
Stearns' Pat. Hol. Augers " $48 " ...dis 25&10 %

Balances.— Light and "Common".....dis 25&10 %

Bells.— dis 70 @ 75 %
Bevin Bros. Mfg Co. Light Hand Bells.....dis 50 @ 5%&10 %
Swiss Pattern Hand Bells.....dis 50 @ 50&10 %
Connell's Door Bells.....dis 50 @ 50&10 %
Gt. Western & Kentucky Cow, new list. ...dis 50&10 %

Belt and Rivet Clippers.
Chambers' No 1, for ¾ bolt, each ...$ 7 50
" " 2, " ⅝ " ... 9 00 } dis. 25 %
" " 3, " ½ " .. 12 00 }

Boring Machines.—
Upright, with Augers.....List $9 00 dis 40&10 %
" without Augers.....5 50 dis 40&10 %
Angular, with Augers.....11 00 dis 40&10 %
" without Augers.....7 00 dis 40&10 %

Bolts.— Eastern Carriage Bolts.....dis 75&5 %—cash
Philadelphia " " .....dis 70 %
Stanley, Wrought Shutter.....dis 50 %
Braces.—Barber's.....dis 40&5 %
Packus.....dis 50&5 %
Spofford.....dis 35 %
American Ball.....

Butts.— Cast Loose Joint, Narrow.....dis 60&10 %
" " Broad.....dis 67½&10 %
Cast Loose Joint, Narrow.....dis 70&10 %
" " Broad.....dis 70&10 %
" Acorn, Loose Pin.....dis 70&10 %
" Acorn " Jap'd.....dis 75&10 %
Mayer's Loose Joint.....dis 70&10 %
Wrought Loose Pin.....dis 50 %
" Table Hinges and Back Flaps.....dis 45 %
" Narrow, Fast.....dis 50 %
" Loose Joint.....dis 50 %

Blind Butts.
Parker.....dis 75&10 %
Clark.....dis 75&10 %
Shepard.....dis 70&10 %
Lull & Porter.....dis 66⅔&10 %
Huffer's.....dis 53⅓ &10 %

Chains.— German Halter and Coil...dis 40 @ 40&10 %
Galvanized Pump.....₩ lb 10c net
Best Proof Coil Chain—(English).

₩ lb.	11¼	8/16	7/16	6/16	5/16	7c gold
	3-16	¼	5-16	⅜	7-16	½ ⅝ in.

Chisels.— Socket Framing.....dis 65, 5&10 %
Socket Firmer.....dis 65, 5&10 %
Butcher's.....$5 00 to £ gold

Casters.— Bed.....dis 50&10 %
Plate.....dis 50&10 %

Coffee Mills.— Box and Side.....dis 25 %
Enterprise.....dis 20 %

Cutlery.— Walden Pocket.....dis 35&5 % cash
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

Drawing Knives.—
Hart Mfg Co.'s.....dis 65, 5&10 %
Adjustable Handle.....dis 20 %

Fry Pans.
Tinned.....dis 5&10 @ 60 %

₩ doz.	$3 50	4 00	4 50	5 00	5 50	6 50	7 50	9 00	10 00
No.	0	1	2	3	4	5	6	7	8

Burnished.....dis 60&5 %

₩ doz.	$3 00	3 75	4 25	4 75	5 25	6 00	7 00	8 00	9 00
No.	0	1	2	3	4	5	6	7	8

Files.
Nicholson.....dis 35 %
Disston.....dis 35
Butcher.....$1 50 £ gold
Spencer.....$4 50 @ 4 75 £ gold

Fluting Machines.
Eagle—3¼ in. roll.....Each $1 62½ net
" —2¼ in. roll....." 2 12½ net
Crown—1¼ in. roll....." 2 62½ net
" —6 in. roll....." 3 00 net
" —8 in. roll....." 5 00 net
Geneva Fluter.....dis 30 %
Favorite com. Fluter & Sad-iron..₩ doz $20 dis 25&10 %

Hammers.
Yerkes & Plumb's.....dis 20 %

Hatchets.
Yerkes & Plumb.....dis 33⅓ %
Hunt.....dis 25 %

Hinges.
Strap and T.....dis 60&10 %

Horse Nails.

	Nos. 5	6	7	8	9	10
Ausable	30	27	25	24	23	22
" Polished & P't'd and Blued and Pointed	31	28	26	25	24	23
Globe	Net list	25	23	21	20	19
Clinton		22	20	19	18	17
" Polished and Pointed		23	21	20	19	18
Southern, all sizes						₩ lb. 14c. net

Discount on Ausable and Clinton, 20 %; Globe, net.

Locks and Knobs.
Branford.....new list, dis 60&10&2 % cash
Gaylord Cabinet.....dis 25&2 % cash
United States Lock Co.....dis 35 %
American Padlocks.....dis 33⅓, 5&2 % cash
Scandinavian Pad Locks.....dis 50&10 %

₩ doz.	$5 00	5 50	6 50	7 50	8 50	10 00	12 50	} dis 50 %
No.	57	58	59	60	61	62	63	
₩ doz.			$15 00		26 00		54 00	} dis 50 %
No.			64		65		66	

Lanterns.—
Square Candle and Oil.....₩ doz. $2 75 @ 3 00
Tubular.....No. 0, $10 50; No. 1, 12 50 ₩ doz. net
Guards, 50 cents extra per doz. net.

Mattocks.—
Long and Short Cutter.....₩ doz. $9 00 @ 9 50 net
Pennsylvania Pattern.....9 50 @ 10 00 net

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets.....dis 20 %
Stebbins' Gates.....dis 62½&10 %
Lincoln's " .....dis 62½&10 %
Landers, Frary & Clark's Petroleum.....dis 20&10 %
Brass Liquor Cocks.....dis 5 %
Cork Lined " .....dis 65 @ 65&10 %

Meat Cutters.— Dixon's.....dis 25 @ 30 %
Woodruff.....dis 25 @ 30 %
Stowe.....dis 25 @ 30 %
Hale's.....New list, dis 50&2 %
American.....dis 25 %
Stuffers.....dis 25 @ 30 %
Enterprise Stuffers.....dis 25 %

Planes.— Ohio Tool Co.....dis 35 & 10 %
Bailey.....dis 25&10 %
Scioto.....dis 50 %
Auburn.....dis 35 & 10 %
New York Tool Co.....dis 50 %

Plane Irons.— Ohio Tool Co.....dis 20 & 10 %
Butcher's.....gold £, $6 50

Plumbs and Levels.
Stanley's Adjustable.....dis 65&10 %
" Non-Adjustable.....dis 65&10 %

Picks.— Philadelphia.....dis 20 %
Hunt's.....dis 25 %

Pumps.— Elefford.....$7 00, dis 20&10 %

Rules— Stanley Boxwood.....dis 70&10 %
Stanley Ivory.....dis 60&10 %

Steelyards.— Hart's Pattern.....dis 60&10 %

₩ doz.	$14 50	17 75	21 00	26 50	31 50	35 50
Lbs	50	100	150	200	250	300

American Pattern.....dis 25 @ 25&10 %

₩ doz.	$5 50	7 00	9 00	10 00	11 00	12 00
Lbs.	50	100	150	200	25	300

English Pattern.....dis 25 @ 25 %

₩ doz.	$7 00	8 67	10 67	12 67	14 67	16 67
Lbs.	50	100	150	200	250	300

Squares.—
Steel and Iron.....dis 50 %; full case, dis 50&10 %
Try Squares, Stanley.....dis 50&10 %
Disston's Try Squares.....dis 50&10 %

Scythes.— Golden Clipper, Damascus Blade, Boxed and Sharpened.....₩ doz. $9 00 net
Clipper No. 10, Bronzed Blade Boxed and Sharpened.....₩ doz. $7 50 net
Clipper No. 5, Painted Red, Boxed and Sharpened.....₩ doz $7 25 net

Saws — Disston's Hand, Panel and Rip.....dis 20 %
Disston's Circular.....dis 30 %
Cross-Cut No. 2, Plain Tooth..₩ ft., 45c net
" " Patent Tooth.....₩ ft., 43c. net
" " Champion Tooth....₩ ft., 35c. net

Shovels and Spades.
Rowland.....dis 50&5 %
Oliver Ames & Sons, new list.....dis 20 %

Sad Irons.— 4 to 10 lbs.....₩ lb., 2½ @ 2½c

Mrs. Potts' Patent.....dis 33⅓ %

Stone.— Arkansas Oil Stone.....₩ lb $2 00 net
Washita Extra....." 36
" No. 1....." 20
" 2....." 16⅔ } dis
" Slips....." 45 } 10 %
" Axe....." 20
Turkey Oil Stone No. 1....." 16½c net
" " " 2....." 10c net
" Axe Stone....." 25c net
Hindostan Oil Stone No. 1.....₩ lb 4 @ 4½c net
" Axe Stone....." 5 @ 5½c net

Screws.
Flat Head Iron.....dis 60 %
" " Brass.....dis 45 %
Round Head Brass.....dis 45 %
" " Iron.....dis 20 %

Spoons.—
Plated.....dis 40 @ 40&5 %
German Silver.....dis 30&10 %
Britannia, Boardman's.....dis 65 %
" Parker's.....dis 65 %
Tanned.....dis 15 @ 20 %
" by case.....dis 20 %

Springs.— Torrey.....₩ doz $2 00 @ 2 10 net
Philadelphia.....5 in., $3 00; 6 in., $4 00 ₩ doz. dis 25 %
Chatfield.....No. 1, $3 50; 2, $4 00; 3, $5 00 ₩ doz. net
Gem Coil No. 1, Large Jap'd.....₩ doz $3 50 }
" No. 2, Medium Jap'd....." 2 50 } dis
" " No. 3, Small....." 2 00 }

Stocks and Dies......dis 10&5 %

Stove Polish.— Gem.....₩ gross, $4 50, dis 5 %
Dixon.....$6 00, dis 5 %
Onyx.....$4 00 @ 4 25 net

Tacks, Brads, &c.— New List.....dis 55&10 %
Shoe Nails—
4-8 and larger, 9c; 3¼-8, 9½c ₩ lb New list, net
Double Pointed Tacks.....dis 40&5 %

Traps.
Genuine Oneida—Newhouse.....dis 33⅓ %
Im. Oneida—Newhouse list (1st quality).....dis 60&10 %

Vises.— Solid Box, Trenton new list.....dis 55 %

Wrenches.—
Girard (Coe's Pattern).....dis 50 @ 10&10 %
Agricultural—
₩ doz 10 in., $3 60; 12 in., $5 40 net; case dis 5 %
Coes' Genuine.....dis 6½&10 %
" Pat. Wrot Bar.....dis 60&10 %
" " Malt.....dis 75&10 %
Taft's " Wrot.....dis 75 @ 75&10 %
Phila. Tool Co., Duplex.....dis 35 %

Wire.—
Bright or Ann'd, No. 19 to 36.....dis 60 %
" No. 27 to 36.....dis 67½ %
" No. 0 to 18.....dis 62½ %
Coppered 0 to 18.....dis 55%
Tinned Broom Wire.....dis 55%
Galvanized, No. 7 to 18.....Market list, dis 50 %

Wringers.— Novelty No. 10.....₩ doz. $60 00 net
Novelty No. 2....." 63 00 net
Universal, No. 2½....." 60 00 net
" No 2....." 63 00 net

PITTSBURGH.

Merchant Iron.

Wood's Patent Planished Sheet.
1st quality (A).....10½c | 2d quality (B).....9½c
Plate Iron—3-16 to ¼ in. thick.....2.8c

Galvanized Iron-Juniata.
Nos. 14 to 20.....12c | No. 27.....15c
Nos. 21 to 24.....13c | No. 28.....16c
Nos. 25 and 26.....14c | No. 29.....18c
Common and imperfect Juniata, to 50% off. Discount, 35 to 40 %.

Roofing Iron, Corrugated or Crimped.

Galvanized Common.	Black.
No. 20.....6½c net cash	No. 20.....3.4c
No. 21 & 22 .6¾ & 7¼ "	Nos. 21 & 22.....3.5 @ 3.8c

Bridge Iron.
Carnegie Bros. & Co.'s list.
Beams and Channels.
Solid Wrought Iron Beams, 3 to 10½ in. x 30 ft..₩ lb 2¾c
" " " " 12 in. by 25 ft..... " 2¾c
" " " " 15 in. by 25 ft..... " 2¾c
Deck Beams, 7 to 9 in. by 30 ft..... " 2¾c
Channel Bars, 1¾ to 10 in. by 30 ft..... " 2¾c
" " 12 in by 30 ft..... " 2¾c

Tee Iron.
1 in. x 1 in. to 5 in. x 3 in.....₩ lb 2.8c

Angle Iron.
Equal Sided, 1x1 to 3½x3½ in.....₩ lb 2.6c
" " 2x2 to 4x4..... " 2.5c
Unequal Sided, 2x1¾ to 5x4..... " 2.5c
Square Root Angles, 2x2 to 3½x3½..... " 2.5c
Star Iron, 1¾x1¾ to 4x4..... " 2.6c
Sash Iron, 1¾x¾x3-16..... " 3.25c
Miscellaneous Shapes, various shapes...₩ lb, 2.6 to 3.5c
Special prices for large lots.

Nails.
Fence and Brads.

4od to 6od	$2.15	4d and 5d	$2.90
8d and 9d	2.40	3d	3.05
6d and 7d	2.65	2d	4.90

Barrel.

¾ in.	6.15	1¼ in.	3.90
⅞ "	5.15	1⅜ "	3.65
1 "	4.65	1½ "	3.15
		1⅝ "	2.90

Lining.

¾ in.	6.65	¾ in.	8.15

Tobacco.....50 cents per keg advance on common
Clinch—All sizes.....3.90

Slating.

5d	3.15	3d	3.90
4d	3.15	2d	5.15
Finishing.		1¾ to 1¾ in.	4.15
1 in.	7.15	2 in.	3.90
1¼ "	6.15	2½ "	3.65
1⅜ "	4.40	3 " and over	3.40
Casing and Box.		5d	3.40
10d to 30d	2.90	4d	3.65
8d	3.15	3d	4.65
Fine Blued.		3d	5.15
4d	3.90	2d	5.90

Cut Spikes—All sizes.....2.40
Boat Spikes—All sizes.....2.90
Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days; or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice. An abatement of 10 cents per keg allowed upon orders of 200 kegs or over.

Steel.
Square, Flat and Octagon Tool Steel.

⅜ to 2 in	12c	7-32 and 4⅛ 5 in	15c
5-16 and 2⅛ to 3 in	13c	3-16 and 5⅛ to 6 in	19c
¼ and 3⅛ to 4 in	14c	5-32 in	23c

Single and Double Shear Nailers—Same as Tool. *Knife, Tup, Die, Mill Pick, Drill*—Ordinary sizes.....12c

Machinery Steel—Round.

⅜ to 2 in	7c	7-32 and 4⅛ 5 in	10c
5-16 and 2⅛ to 3 in	8c	3-16 and 5⅛ to 6 in	13c
¼ and 3⅛ to 4 in	9c	5-32 in	18c
Cast Spring Steel.		1⅝ to 3x¼-32 to 1-16 in	7c
1 to 4x¼ to ⅛ in	6c	⅛ to 1⅜x5-32 to 3-16 in	8c

Agricultural Steels.

Solid Cast Steel Plow, 4 to 16 by 3-16 to ⅜ in			6c
"Iron Center Plow," 4 to 16x3-16 to ⅜ in			6½c
"Iron Back Plow," 4 to 16x3-16 to ⅜ in			7½c
Soft Steel Center Plow, 4 to 16x3-16 to ⅜ in			9c
Landside and Cultivator, C. S., ⅛ in. thick			8½c
Circular Plow Coulters, 5-32 to ¼ in. thick			10c
Reaper and Scythe			12c
Fork and Hoe			6c
Horse Rake Teeth, tol ength			7c
Finger Bar			7½c
Cutter Bars, C. S.			7½c
" German Spring Steel			6½c
Cornstalk Cutter beveled to length			7c
Planters' Hoe, C. S.			8c
Hoe, C. S.			6½c

Sheet Steels.

German, 10 to 16 g	7c	Common C'st, 17 to 20 g	9c
" 17 to 20 g	10c	Best Cast, 10 to 16 g	12c
Common C'st, 10 to 16 g.	8c	" " 17 to 20 g	13c

Rolls and Castings.
Furnace, Floor and Straightening Plates.....1½c
Housings and Castings not otherwise specified.....2½c
Guide Plates.....2½c
Spindles and coupling boxes.....1½c
Sand Rolls and Pinions, large size.....2½c
" small size.....3 c
Pipe Mill Castings.....4 c
Rolling Mill Castings under 50 lbs.....3 c
Spur and Bevel Wheels, large.....3 c
" small.....4 c
Pulleys up to 30 inches.....4 c
" over 30 inches.....3½c
Engine Castings, light.....3½c
" heavy.....3½c

Chilled Rolls.

6 to 7 in. diam.,	7 to 20 in. long		5 c
8 to 15 in.	"	8 to 40 in. "	4 c
15 to 24 in.	"	15 to 72 in. "	4 c
24 to 31 in.	"	72 to 108 in. "	4 c

Heavy Hardware.
Bolts, Screws, Nuts, etc.
Lewis, Oliver & Phillips, discount off Standard List.
Carriage & Tire Bolts, ordinary orders 75, & 3% off net
Stove Bolts.....40&5% off net
Elevator Bolts.....30 % off net
Machine and Square Head Bolts.....60&10 % off net
Coach and Lag Screws.....60&10 % off net
Bolt Ends.....60&10 % off net
Pat. Hot Pressed Sq. and Hex. Nuts.....8c ₩ lb off net
Washers, all made from new band iron..8c ₩ lb off net
Nuts and Washers in 25 lb boxes, ½c ₩ lb ex. Nuts and Washers in lots less than one keg each size, ½c ₩ lb ex. Nuts and Washers in 5 lb boxes, 1c ₩ lb ex
Strap and T Hinges.....60&10 % off net
Harrow Teeth.....net
Skein Bolts.....net
Cast Iron Washers.....3½c ₩ lb net
Fire Shovels and Pokers.....50 % off

Wagon Hardware.
Single Trees, Neck Yokes and Double Trees, made from best selected hickory, and ironed complete, in the most approved patterns.
No. 1 Southern Plow Single Tree, Ironed complete, Irons all Wrought.....each, 25c net
No. 2 Western Plow Single Tree, Ironed complete, Irons all Wrought.....each, 35c net
No. 3 Wagon Single Tree, Iron complete, Irons all Wrought, except Malleable Ferrule.....each, 50c net
No. 4 Wagon Single Tree, Ironed complete, Irons all Wrought; Improved End Pieces riveted on; one side acts as a wear iron for wheel to rub against.....each, 50c net
Neck Yoke, Ironed complete, Irons all Wrought except End Ferrules, with Wt. Iron Rings.....each, 60c net
Southern Plow Double Tree, Ironed complete, Irons all Wrought.....each, 50c net
Wagon Box Strap Bolts—
For orders of 100 Set, 40&10% dis.

10 in. long by 7-16 at Screw End,	₩ set of 8 bolts..					45c
12 in.	"	7/16	"	"	8	" .. 55c
10 in.	"	9-16	"	"	8	" .. 65c
12 in.	"	9-16	"	"	8	" .. 70c
14 in.	"	9-16	"	"	8	" .. 80c
10 in.	"	⅝	"	"	8	" .. 80c
12 in.	"	⅝	"	"	8	" .. 80c
14 in.	"	⅝	"	"	8	" .. 90c
16 in.	"	⅝	"	"	8	" .. 1.00
18 in.	"	⅝	"	"	8	" .. 1.10
20 in.	"	⅝	"	"	8	" .. 1.20

50 ₩ set for each additional inch over 14 inches. All lengths made.

Horse Shoes, Etc.— In 100 keg lots.
Juniata Horse Shoes.....per keg. $5.25
" Mule " 4.25
" "Roadster" pattern.....4.50
Steel Toe Calks.....per 7½c lb.
Thistlewood & Co.'s Self-Sharpening Horse Shoes.....per keg, $5.25
Thistlewood & Co.'s Self-Sharpening Snow Shoes.....5.50
Toe Calks.....per lb. 8c

White and Red Lead.
White Lead in Oil, Assorted Kegs (all sizes).....7½c
" " 25 lb Tin Pails, 521 lb Cases.....8 c
" " 12½ lb Tin " 8½c
Red Lead.....in kegs, 6½c; in barrels, 6 c
Orange Mineral.....8½c; " 8 c
Litharge.....6½c; " 6 c
Dry White Lead, less than 500 lbs., 7½c; over 500 lbs. 6½c
White Lead in Oil in lots of less than 500 lbs., ½c additional.
Terms: Note at sixty days, or if paid within 15 days from date of invoice, a discount of 1½ per cent. will be allowed, but not otherwise.

Window Glass.
Per Box of 50 Feet.—Discount 75 @ 75&10 %.

Single Strength.

Size.	AA.	A.	B.	C.
6 x 8 to 10 x 15	$7.50	$6.75	$6.25	$5.75
11 x 14 to 16 x 24	8.50	7.75	7.25	6.50
18 x 22 to 20 x 30	10.75	9.75	8.75	7.75
15 x 36 to 24 x 30	12.25	10.75	9.00	
26 x 28 to 24 x 36	13.00	11.50	9.75	
26 x 36 to 26 x 44	14.50	13.25	10.75	
26 x 46 to 30 x 50	15.00	14.00	11.25	
30 x 52 to 30 x 54				
30 x 56 to 34 x 56				
34 x 58 to 34 x 60				
36 x 60 to 40 x 60				
Double Strength.				
6 x 8 to 10 x 15	12.00	11.00	10.00	25
11 x 14 to 16 x 24	13.75	12.50	11.75	10.50
18 x 22 to 20 x 30	17.25	15.75	14.00	
15 x 36 to 24 x 30	19.75	17.25	14.50	
26 x 28 to 24 x 36	21.00	18.50	15.75	
26 x 36 to 26 x 44	23.25	21.25	17.25	
26 x 46 to 30 x 50	24.00	22.50	18.00	
30 x 52 to 30 x 54	25.75	23.25	19.25	
30 x 56 to 34 x 56	27.75	25.00	21.75	
34 x 58 to 34 x 60	29.25	27.75	24.00	
36 x 60 to 40 x 60	33.25	30.00	27.75	

An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length and not making more than 81 united inches, will be charged in the 84 united inches bracket.

CHICAGO.

(The Chicago Stamping Co., 10, 12 & 14 Lake St.)
March 3, 1879.

Tin Plate.—

10x14. IC, Ch'l Best,	7 25	14x20. IXX, Ch'l Best,	11 25
10x14 IX, " "	9 25	14x20. IXXX, " "	13 25
12x12. IC, " "	7 25	DC, 100 Plate " "	7 25
12x12. IX, " "	9 25	DX, " "	9 25
14x20. IC, " "	7 25	DXX, " "	11 25
14x20. IX, " "	9 25	DXXX, " "	13 25
20x28. IC, Charcoal Roofing, Good		IC, Roofing, "	6 75
20x28. IC, " Best		IX, " "	8 75
20x28. IX, " "			13 50
10x14. IC, Coke Plates			17 50
14x20. IC, "			6 75
10x20. IC, "			6 75

Block Tin —

Large Pigs	18c	Bars	20c
Small	19c		

Zinc.— Sheet, 500 to 1000 lb. Casks.....6¾c
Loose Sheets.....7¼c
Slab Zinc or Spelter.....5 c
Copper.— Bottoms.....26c
Sheathing.....24c
Planished.....33c
" Boiler lengths.....36c
Ingot.....16½c
Bolt.....24c
Braziers' Sheets.—
30x60, 6 to 7 lbs....₩ lb 30c | 30x60, 10 to 12 lbs...₩ lb 26c
30x60, 8 to 9 lbs.... " 28c | 30x60, 15 to 100 lbs. " 24c
Solder.— F. S. & Co.'s make
Best Fine.....14c
No. 1.....13c
Roofing.....11½c
Braziers or Spelter Solder.....25c
Antimony.....15c
Babbit Metal— F. S. & Co.'s.....12c
No. 2.....10c

Sheet Iron.—

	Common.	Smooth. Com.	Smooth Charcoal.	Smooth Juniata
No. 24	5 c	3 80c	5½c	7 c
25 & 26	3-20c	4 c	6 c	7½c
27	3-40c	4-20c	6½c	7½c

Galvanized Iron.— dis 45, 5.

No. 16 to 20	12c	No. 27	15c
21 to 24	13c	28	16c
25 & 26	14c	No. 1 Stained	13½c
Russia Iron.— Perfect	13½c	In Sheets, 1c. higher.	
American Russia.— A	10½c	B	9½c
		In sheets, 1c higher	
Lead.— Pig	5 c	Lead Pipe, in full coils	5½
Bar	5½c	Lead Pipe, when cut..	6
Wire— bright		Sheet Lead	6½
Coppered	dis 45 %		

BOSTON.

Reported by Macomber, Bigelow & Dowse, 156 to 164 Oliver St.

Anvils.—"Eagle American" ₩ ℔ 9c. dis 20 %
Apple Parers.—Reading ₩ doz $4.50
Lightning ₩ doz 6.50
Reading "78" ₩ doz 7.50
Aiken's Tools dis 40&10 %
Anvil & Vise.—
No. 1, $4.50; 2, 3.75; 3, 3.00 each dis 25 %
Augurs & Bitts.—Snell's Auger dis 50 %
L'Hommedieu's Ship Augers dis 15 %
Jenning's Bitts dis 10&10&10 %
Cook's Bitts dis 50 %
Shepardson's Double-Cut Bitts dis 50 %
" " Gimlets dis 50 %
Stearn's Extension Hollow Augers per doz $30.00
Bonney's " " " per doz 33.00
Axes.—Blue Jackets per doz 7.50
Red Cross per doz 7.00
" Handled per doz 9.00
Dowse " Boys' dis 15 %
Ax Handles.—
Oak Extra, 31 in., No. A ₩ doz $2.25
" 34 in., No. A ₩ doz 2.50
" 31 in., No. B ₩ doz 1.75
" 34 in., No. B ₩ doz 2.00
" 31 or 34 in., No. C ₩ doz 1.25
Axle Clips dis 60 %
Balances.—Chatillon's dis 25&10 %
Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers) per ft. 30
" Half-Round per ft, ⅝, 2½c; ¾, 4½c
Wrought " per ft, ⅝, 3½c; ¾, 4½c; ⅞, 5c
Bells.—Connel's Crank Gong dis 40&10 %
Bird Cages.
Japanned M. B. & D., reduced list, 1879 dis 33⅓ %
Brass " " " 1879 dis 25 %
Blind Fasts.—Lock Fasts ₩ C sets $4.00
No. 6 Fasts ₩ C sets 4.00
Veazie Fasts ₩ C sets 6.50
Shedd's ₩ C sets 7.00
Blind Hinges.—Mall. Hook, 3 holes ₩ C sets 6.00
Brad Awl Handles.—
Phœnix Adjustable ₩ doz $2.00
Bolts.—Norway Iron Carriage dis 75 %
Common " dis 75&10 %
Borax.—Refined ₩ ℔ 10c
Boring Machines.—Snell Upright each, $2.75
Snell Angle each, 3.50
" Augers ₩ set 1.60
Braces.—Barber's dis 40& 5 %
Spofford's dis 50 %
Backus' dis 05 %
Bracket Saws.—Roger's each $2.25
Bracket Saws, extra quality, to No. 1 ₩ gro $0.75
Steel Frame, with patterns ₩ doz 7.50
Lester dis 25 %
New Rogers, all iron each, $2.25
Brackets.
H. B. & M. Flower Pot dis 50&10 %
Bronzed Shelf, M. B. & D. list dis 10&10 %
Bread Kneader.—Stanyan dis 25 %
No. 4 capacity 3 loaves ₩ doz $24.00
No. 5 " 5 " ₩ doz 27.00
No. 6 " 8 " ₩ doz 33.00
Bronze Hardware.—Norwalk Lock Co. dis 50&10 %
Butts.—Union Fast Joint dis 50&10 %
" Loose " dis 75&10 %
" Japanned Acorn dis 75&10 %
" Silvered " dis 75&10 %
" Boston Fihish dis 75&10 %
Centennial Spring dis 25 %
Carriage Jacks.—Climax ₩ doz $15.00
" large size ₩ doz 18.00
Cartridges.—U. S. Cartridge Co. dis 50&10 %
Cards.—Sargent Horse and Curry dis 33⅓&10 %
" Cotton dis 25&10 %
" Wool dis 25&10 %
Casters.—Bed and Table dis 50&10 %
Chain.—Traces 6½, 10, 4, streight ₩ pair 45c
" 6½, 10, 4, twisted ₩ pair 50c
" 7, 12, 2, " ₩ pair 75c
Coil 3-16 ₩ ℔ 10c
" ¼ ₩ ℔ 7½c
" 5-16 ₩ ℔ 6½c
" ⅜ ₩ ℔ 5½c
" 7-16 ₩ ℔ 5c
" ½ ₩ ℔ 5c
Chalk.—White, Carpenter's ₩ gross 55c
Red, Carpenter's ₩ gross 75c
Blue, " ₩ gross 90c
Chisels.—Hart, Bliven & Mead, Framing dis 70 %
Underhill, Framing dis 25 %
Buck's Shank, Framing dis 25 %
Clothes Line.—
Galvanized Wire, 100 feet each ₩ doz $4.00
Coal Hods.—Ironclad.—Galvanized dis 25 %
Japanned dis 30 %
Copper Rivets. dis 50 %
Cocks.—Brass, L. F. & C. dis 50 %
Cordage.—Manila, usual trade dis 5c ₩ ℔ 11½c
Jute ₩ ℔ 9c
Cow Ties. dis 45 %
No. 30, 3 ft. No. 6 Wire, with toggle ₩ doz $2.60
No. 35, 3 ft. " " with snap ₩ doz 3.30
No. 40, 3½ ft. " " with toggle ₩ doz 3.90
No. 45, 3½ ft. " " with snap ₩ doz 4.10
No. 50, 4 ft. No. 4 " with toggle ₩ doz 4.50
No. 55, 4 ft. " " with snap ₩ doz 4.75
No. 60, 4½ ft. " 3 " with toggle ₩ doz 5.38
No. 65, 4½ ft. " " with snap ₩ doz 5.62
Crow-Bars.—Cast Steel ₩ ℔ 7c
Iron, Steel Pointed ₩ ℔ 4½c
Cutlery.—Pocket, American Shear Co.'s dis 40 %
Butcher Knives, "Woods," Lap Bolster, Square Handle dis 33⅓ %
Steak Knives dis 20 %
Lap Bolster, Oval Handle dis 25 %
Sticking dis 33⅓ %
Skinning dis 33⅓ %
Butcher, Common Round Handle, "Woods" dis 25 %
Shoe Knives, "Woods" dis 10 %
Dividers.—Cook's dis 25 %
Dog Collars. dis 20 %
Dog Muzzles.—Automatic dis 15 %
Door Springs.—Torrey's Rod ₩ doz $1.75
Gem Coil dis 10 %
Eccentric Steel Coil Spring, No. 1 ₩ doz $2.75
Crown ₩ doz $1.25
Warners ₩ doz $2.25
Door Stops.—"Thurston's" dis 50 %
Drawer Knobs.—"Thurston's" dis 50 %
Drills.—Morse Bitt Stock dis 25 %
Morse Straight Shank dis 20 %
Emery.—Wellington Mills ₩ ℔ 10c
Alden's ₩ ℔ 6c
Enamelled Ware.
Standard Mfg. Co. Kettles dis 60 %
" Sauce Pans dis 40 %
Felloe Plates.—Wrought ₩ ℔ 7c
Files.—Madden & Cockayne dis 35 %
American File Co. dis 40 %
Nicholson " dis 35 %
Fluting Machines.
Knox, with 6 inch rolls ₩ doz $56.00
Geneva ₩ doz 13.50
Rochester ₩ doz 12.00
"Princess" ₩ doz 24.00
Forks.
W. C. & Co., Manure dis 50&10 %
Gimlet Bitts.
Genuine German, No. 125, 1-32 to 8-32, $1.00; 10-32, $1.10; 12-32, $1.20 ₩ doz gold.
Glass Cutters.
Combination Class Cutter and Knife Sharpener ₩ doz $1.00
Grub Hoes.—K. P. & Co.'s No. 2 ₩ doz 7.50
Hammers.—Maydole's dis 15 %
Hammond's dis 20 %
Dowse's Steel, A. E ₩ doz $4.00
M. B. & D. dis 25 %
Hangers & Rollers.—Anti-Friction dis 60&10 %
Climax dis 60&10 %
Novelty dis 40 %
Common dis 60&10 %
Hand Screws dis 20 %
Hatchets.—Dis. 15 %
C. F. Dowse, Combination per doz., $10.00
Underhill dis 30 %
Hay Knives.—Lightning ₩ doz $18.00
Hinges.—Strap and T (new list) dis 60&10 %
Providence Plate ₩ ℔ 4c
Wrought Screw Hook ₩ ℔ 4c
Hoes.—W. C. & Co.'s dis 50&10 %
Hooks and Staples.—Brewers' dis 50 %
Horse Nails. No. 6 7 8 9
National Finished .23 .21 .20 .19 dis 25 %
Putnam Pointed .23 .21 .20 .19 10 %
Horse Nails.—Bridgewater dis 25 %
No. 6, 23; No. 7, 21; No. 8, 20; No. 9, 19.
Knobs.—"Norwalk."
Mineral ₩ doz $0.65
Porcelain, Japanned Mtg ₩ doz .85
" Por. Rose Nickel Mtg ₩ doz 2.50
" Plated " " ₩ doz 2.50
Silver Glass ₩ doz 8.00
Bell Pulls ₩ doz 6.00
Lanterns.—Tubulars, No. 0 ₩ doz 10.00
Railroad, Oil, No. 43 ₩ doz 8.00
Guarded, Oil and Candle, No. 24 ₩ doz 3.50
Triangular ₩ doz 4.00
Hurricane dis 20 %
Lawn Mowers.—"Charter Oak"
8 inch cut each $ 8.00
10 " " 10.00
13 " " 13.00
15 " " 15.00
18 " " 18.00
Lead.—Sheet ₩ ℔ 5½c
Pipe ₩ ℔ 5c
Locks.—Norwalk Lock Co. (reduced list) dis 50&10 %
Eagle Cabinet dis 25 %
" Trunk dis 25 %
W. Wilcox & Co., Padlocks dis 33⅓&5 %
American Lock Co.'s Steel Key dis 33⅓ %
Metallic Sleeves.—Mann's Patent dis 33⅓ %
Manure Forks.—W. C. & Co. dis 50&10 %
Mattocks.—K. P. & Co., Long Cutter ₩ doz $9.00
K. P. & Co., Short Cutter ₩ doz 8.50
" Pick " ₩ doz 9.00
Measuring Tapes.—Eddy's dis 20 %
Meat Cutters.—Miles' Challenge dis 30 %
Hale's dis 50 %
American dis 25 %
Money Drawers.—Tucker's Alarm ₩ doz $22.50
Mouse Traps.—Delusion ₩ doz 2.00
Oilers.—Zinc and Tin dis 50 %
Brass and Copper dis 50 %
Ox Bows.—Extra finished and varnished dis 10 %
1¼ in., ₩ doz. pair..$5.75 | 2 in., ₩ doz. pair....$9.00
1½ in., " " .. 8.00 | 2½ " " 11.00
Padlocks.—W. Wilcox & Co.'s dis 33⅓&2½ %
Miller's Brass ₩ doz $9.00
Picks.—K. P. & Co., Adze Eye, 5 to 6 ℔ ₩ doz 6.50
" " 6 to 7 ℔ ₩ doz 7.00
Planes.—Greenfield Tool Co. dis 40 %
N. Y. Tool Co. dis 50 %
English Iron dis 20 %
Bailey's dis 25&10 %
Plated Ware.—Rogers & Bro. dis 40&5 %
Pliers.—Vom Cleff & Co.'s Gold lis %
Button's Wire Pliers dis 33⅓ %
Plumb & Levels.—Stanley, R. & L. Co. dis 60&10 %
Pocket Knives.
American Shear Co.'s dis 33⅓&10 %
Potato Diggers.
W. C. & Co. reduced list dis 50&10 %
Pulley Blocks dis 33⅓ %
Pumps.—Union Manufacturing Co.
Iron Cistern dis 55 %
" Pitcher Spout dis 50 %
Copper dis 25 %
Rivets.—Black dis 50 %
Carriage in 10 ℔ papers dis 35 %
Copper dis 50 %
Razor Strops.—Torrey's Full line
Rules.—Stanley Boxwood, dis 70&10 %
" Ivory, dis 60&10 %
Sadirons.—Common ₩ ℔ 2½c
Laundry ₩ ℔ 5c
Tailor's Goose ₩ ℔ 5c
Enterprise, "Potts" dis 33⅓ %
Mrs. Potts' Large Polishing, Nickeled ₩ doz net $2.50
Sash Locks.—Ring & Hutchinson's, new list dis 40 %
Hopkins & Dickinson's dis 40 %
Sandpaper.—Baeder & Adamson dis 20 %
M. B. & D. dis 25 %
Sash Weights.—Patent Eye ₩ ℔ 1½c
Saws.—Hand Saws, Disston's dis 20 %
Wheeler & Clemson dis 30 %
Cross-Cut Saws.
W. M. & C., Common Tooth, No. 1 ₩ foot 35c
" " Champion " ₩ foot 35c
Disston's, Common " ₩ foot 44c
" Gt. American " ₩ foot 44c
Boynton's Lightning " ₩ foot 45c
M. B. & D., Hand Saws dis 40 %
W. M. & Co.'s, Circular Saws dis 40 %
Saw Setts.—Spring Lever ₩ doz $10.00
Saw Blades.—Disston dis 20 %
W. M. & C. dis 10 %
Welch & Grimith, Extra ₩ doz $9.60
" " No. 2 ₩ doz 8.00
Scales.—Fairbanks dis 25 %
Howe dis 25 %
Screws.—Aiken's Flat-Head Iron dis 60 %
American Flat-Head Iron dis 50 %
" " Brass dis 45 %
" Round-Head " dis 30 %
" " Iron dis 45 %
Grilley " Nickel-plated Piano dis 55&5 %
" " Common dis 50 %
Shaves.—Kimball's ₩ inch 7½c
Watrous dis 15 %
Shears.—American Shear Co. dis 75 %
Shot.—Tatham's ₩ ℔ 6c
Shovels.—O. Ames dis 20 %
O. Ames, other brands dis 20 %
M. B. & D. dis 20 %
Oxford, Birmingham Pattern dis 45 %
Snow Shovels.—Malleable tips ₩ doz $5.00
Slates.—Union dis 25 %
Acme dis 20 %
Spoons.—Tinned Iron dis 40 %
Britannia dis 50 %
Rogers' A No. 1 dis 40&5 %
Stock and Dies.—King's dis 10&5 %
Tacks.—A. Field & Son's dis 50&25 %
Pittsfield dis 50&25 %
Traps.—Oneida, Genuine dis 33⅓ %
Oneida, Imitation, H. & N. dis 50&10 %
Blake's dis 50&10 %
Tree Scrapers.—No. 1 ₩ doz. $2.00
No. 2 ₩ doz 3.00
No. 3 " ₩ doz 4.00
Vises.—Solid Box, Blacksmith's ₩ ℔ 10½c
Simpson's Adjustable dis 20&10 %
Howard Vise Co. dis 33⅓ %
P. L. & Co., Solid Blacksmiths' new list dis 40 %
Weather Strips.
Browne's Flexible Rubber dis 30 %
In 20 feet boxes; No. 1, ½ in. wide, ₩ yard, 10c.; No. 2, ⅝ in., 15c.; No. 3, ¾ in., 20c.; No. 4, 1 in., 25c.
Valentine's Felt Moulding dis 30 %
Black Walnut Spring Weather Strips ₩ doz. $3.00
Window Awning.
Dearborns' per window; $1.00, dis 25 %
Window Springs. dis 20 %
Babcock's No. 3 ₩ gross $6.25
" " 4 ₩ gross 4.15
Wire Goods.—Gate Hooks and Eyes, &c. dis 70&10 %
Wrenches.—A. G. Coe's dis 60&10&10 %
Girard Mfg. Co. dis 60&10&10&10 %
Wringers.—Universal, No. 2 ₩ doz $68.00
Universal, No. 2½ ₩ doz 60.00
Novelty, No. 10 ₩ doz 60.00
" No. 2 ₩ doz 63.00
" No. 22 ₩ doz 67.00
Excelsior, No. A ₩ doz 78.00
" No. B ₩ doz 86.00
" No. CC ₩ doz 108.00
Novelty Set Tub, E ₩ doz 66.00
Eureka ₩ doz 54.00
Zinc. ₩ ℔ 6½c
Withington, Cooley & Co.—Hoes, Rakes, Forks, &c. dis 50&10 %. Special rate for Export.

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellers & Co.)

Tin Plate.

IC, 10x14, Best Char.	$ 7 25	DX, 13½x17, B. Char.	$ 9 25
IX, 10x14, " "	9 25	DXX, 13½x17 " "	11 25
IC, 12x 2, " "	7 25	DXXX, 13½x17 " "	13 25
IX, 12x12, " "	9 25	DXXXX, 13½x17, " "	15 25
IC, 14x20, " "	7 25	IC, 20x28, " "	17 50
IX, 14x20, " "	9 25	IX, 20x28, " "	21 50
IXX, 14x20, " "	11 25	IXX, 20x28, " "	25 50
IXXX, 14x20, B. Char.	14 25	IC, 14x20, Best Roof..	7 75
IXXXX, 14x20, " "	15 25	IX, 14x20, " "	9 75
IC, 12x24, " "	7 25	IC, 20x28, " "	13 75
IX, 11x 4, " "	9 75	IX, 20x28, " "	17 75
IC, 14x14, " "	13 25	IC, 10x14, Best Coke..	6 00
IX, 14x14, " "	15 25	IC 14x20, " "	6 00
IXX, 14x14, " "	18 25	IC, 10x28, " "	9 75
DC, 12½x17, " "	7 25	Pr box 25 sh's Safe Tin	4 50

Sheet Iron.	Com'n.	Sm'th.	B L O Sm'th.	D. Ref'd Sm'th.
No. 16 to 20	3 c	3 8c	5 6c	6 5c
No. 22 to 24	3 0c	3 8c	5 4c	7 0c
No. 26	3 10c	3 9c	6 c	7 c
No. 27	3 20c	4 c	6 2c	7 4c

Genuine Russia Iron.

Perfect—No. 9, 10, 11, 12 per lb. 13½c
No. 1 Stained—No. 9, 10, 11, 12 per lb. 13 c
Tare 25 lbs. to Bdle. 2 or less than Bdle. add 1c. ₩ lb.

Patent Planished Iron

No. 24 to 27, A quality per lb. 10½c
" B " " 9½ c
For less than Bdle. add 1c. per lb.

Galvanized Sheet Iron.

Juniata, or 1st quality, Discount for full bundles ...45 %

Block Tin.

Banca, Large Pigs	21c	do. Small	18c
Straits, Large Pigs	17c	Bar	19c
Eng. Ref'd, Large Pig	17c		

Solder.

Extra in Bars	12c	No. 2, in Bars	9½c
No. 1, in "	10c	Spelter Solder	4c
Pig Lead—Pigs	4c	in Bars	5c
Antimony			14c
Bismuth			$ 1 50
Nickel			2 00
Crucibles.—Dixon's			₩ No. 4½c

Babbit Metal.

No. 1	₩ ℔ 16c	No. 3	₩ ℔ 11 c
" 2	" 14c	" 4	" 7½c

Copper.

Brazier's, 30x60,	14 to 100 lbs. Sheets		24c
" "	10, 11 & 12 lbs., "		25c
" "	8 and 9 lbs. "		26c
" "	6 and 7 lbs. "		30c
Tinned, 14x48, 14 and 16 oz.			25c
Planished, 14x60, 14 and 16 oz.			36c
"	Doller Sizes, 14 and 16 oz.		36c
Gutter Copper, 20 and 24x72, 10, 11 and 12 ℔. Sheets			19c
"	14 ℔. Sheets		24c
Reservoir Copper, 16x60 and 18x60			23c
Bar Copper, Square and Round, ¼ to 1⅛ inch			24c
" "	⅜ inch		27c
Copper Bottoms			48
Metallic Bottoms			46c
Soldering Coppers			46c

Brass.

Roll, No. 10 to 28, 12 in. in width	25c
" 30, 12 in. in width	26c
" 32, 16 "	32c
" 34, 16 "	33c
" 36, 16 "	34c
Platers, No. 40, 6	40c

Discount 10 per cent.

Brass and Copper Wire.

	Brass.	Copper.		Brass.	Copper
No. 0 to 20	28c	34c	No. 24	35c	40c
" 21	31c	41c	" 25	38c	44c
" 22	32c	44c	" 26	40c	50c
" 23	33c	48c	" 27	48c	52c

Brass Spring Wire, 2c. ₩ ℔ advance.
Discount 10 per cent.

Brass Tubing

Plain ⅛ to 3 inch	38c	5-16 inch	38c
⅜ inch	36c	¼ "	40c
Copper Rivets and Burs			dis 50 %
Brass Kettles 8 to 13 inches			₩ ℔ 52c
" " all sizes over 13 inches			" 40c
Sheet Zinc.—600 lbs. cask			" 7c
250 lbs. cask			" 7½c
Sheet			" 7½c

Wire.—Iron, Bright Market dis 15 %
Iron, Coppered Market dis 10 %
Fence, Nos. 7, 8 and 9 ₩ ℔ 3.14c
Trellis, Nos. 10 and 11 " 4¾c
" No. 12 " 5 c
" No. 13 " 5½c
Broom, Tinned, Nos. 18 to 22 " 10c
Fence Staples per keg 5 c
Per lb. 8½c
Iron Rivets.—Black, papered dis 25 %
Tinned, papered dis 25 %
In bulk.....new 5-16 ¼ 5-16 ¼ in diam.
7 50 7 50 6 00 6 25 per lb.
Tacks.—New Hardware List dis 50 %
Sad Irons ₩ ℔ 3½c
Enameled Kettles.—Standard Mfg. Co. dis 60 %
Enameled Sauce Pans. dis 40 & 10 %
Standard Mfg. Co. dis 40 %
Enameled Boilers.—Standard Mfg. Co's dis 60&10 %
Dripping Pans.—Smooth Iron ₩ ℔ 8c
Geneva Fluters per doz $12.00
Monroe Fluters " 11.50
Stove Polish.—Dixon's ₩ gross 6.00
Gem " 4.50
Japanese " .50
Dixon's, in bulk ₩ ℔ 8c
Coffee Mills.—Parker's dis 25 %
Granite Iron Ware dis 33⅓ %
Spoons.—Tea & Table dis 35 %
Basting dis 40 %
Retinned Iron Ware dis 33⅓ & 5%

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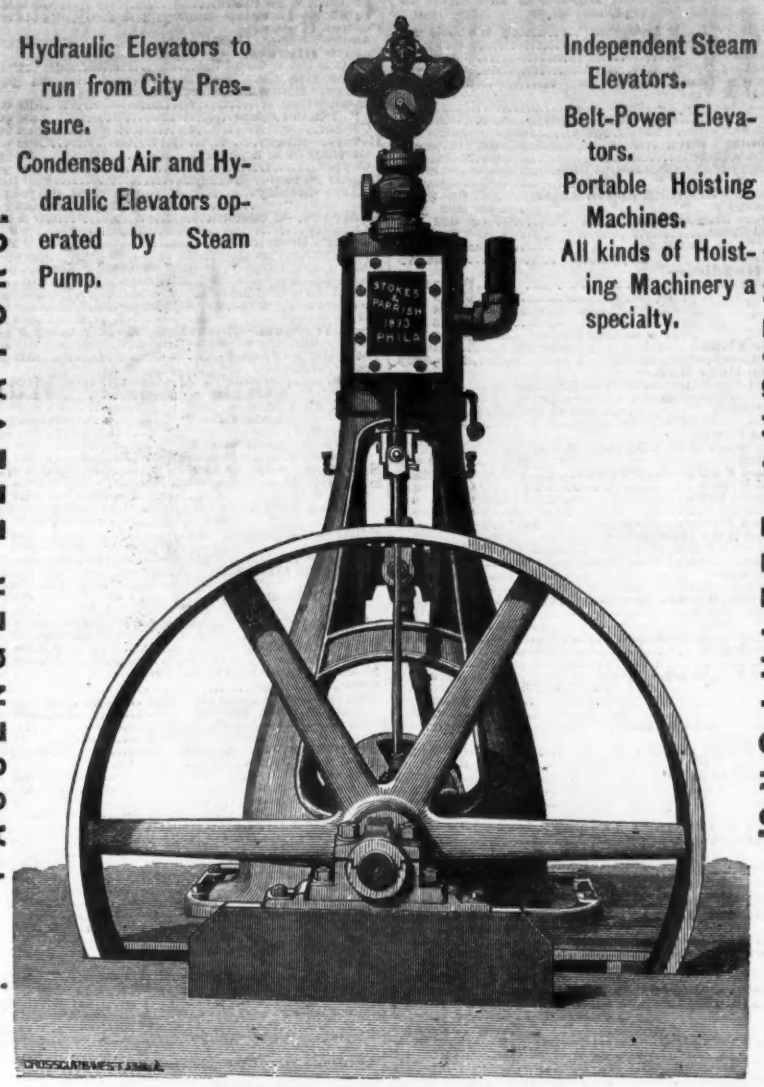
Hydraulic Elevators to run from City Pressure.

Condensed Air and Hydraulic Elevators operated by Steam Pump.



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All kinds of Hoisting Machinery a specialty.

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VERTICAL STEAM ENGINE.

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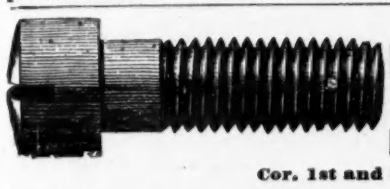
Automatic machines to straighten and cut wire of all sizes to any length; to cut and mill wire for butt pins, bolt shanks and similar articles; to make all kinds of staples, with either square, fleam, chisel or shear points; to roll points on picture nails and similar articles without heat; to cut and form wire into various shapes and sizes, such as rings, buckles, fence barbs and similar articles; to make spiral springs; and for other special purposes to order.

Machines to straighten and cut wire by hand; to rivet together articles of hardware; to drill butts and other hardware; to mill butts; to drill or countersink several holes at once, close together or far apart, on a regular or irregular line; to drill, tap, mill and thread small articles of hardware, such as thumb screws, thumb nuts, &c.; to spin plain or ornamental caps on picture nails, tassel hooks, &c.; for grinding, buffing and polishing; to drive screws into locks, knobs, &c.; foot and hand presses and special power presses to order.



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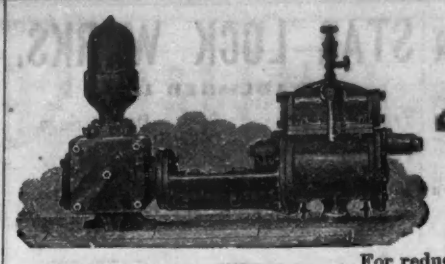

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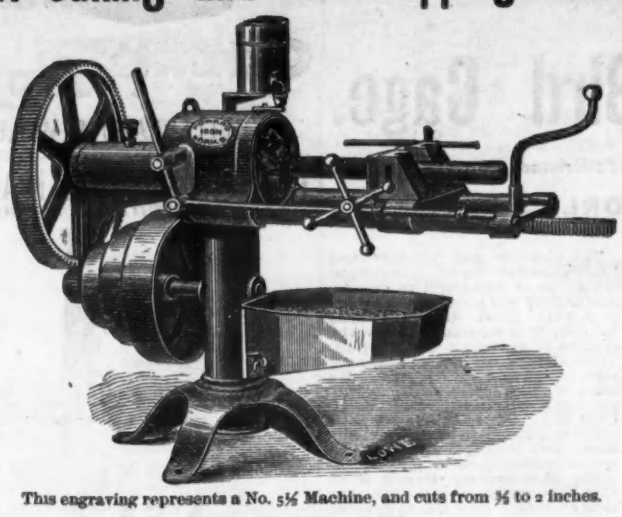

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No. 8 "	⅜ to 3 " "	500
No. 4 (Double Header), cuts from	¼ to ⅝ inch, price,	350

This engraving represents a No. 5½ Machine, and cuts from ⅜ to 2 inches.

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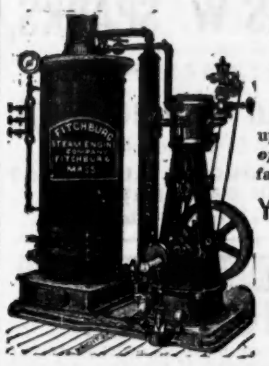

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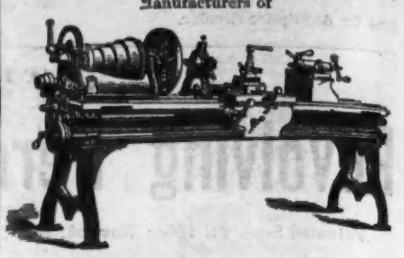

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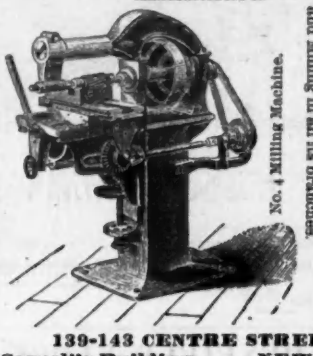

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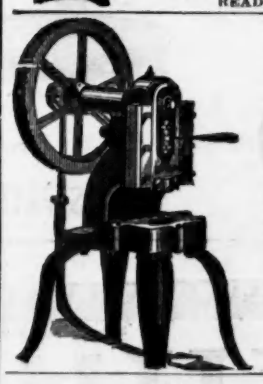

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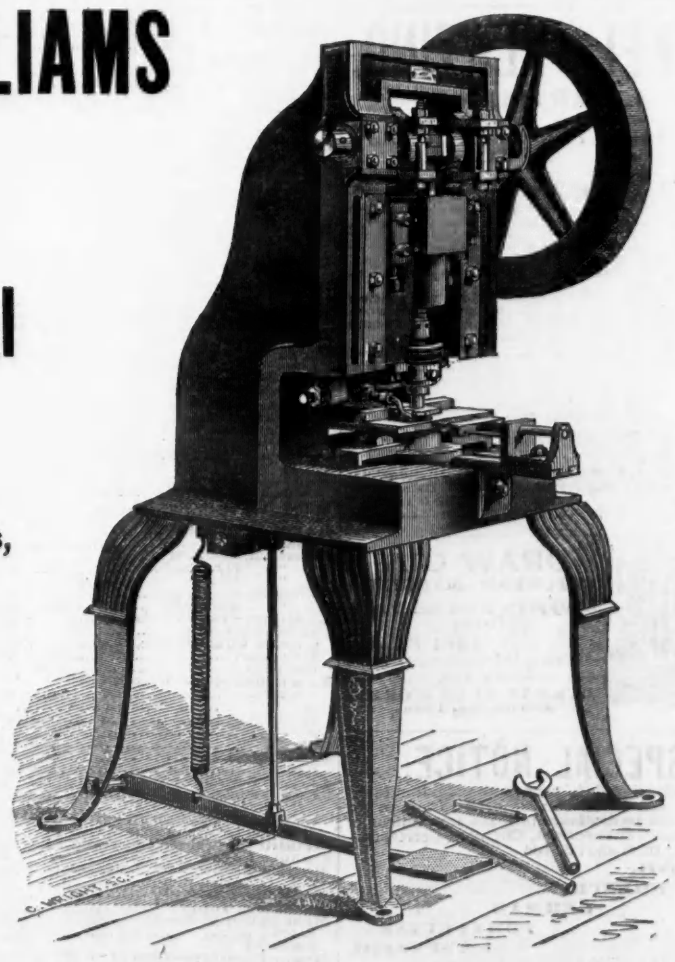

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It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the accompanying list. We guarantee the Judson Governor will do all any other Governor can do, and in accuracy and durability—the main essentials—we guarantee it shall do more.

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THE JUDSON PATENT

Improved Steam Governor.

Size, Inch.	Plain.	Bright Finished.	Extra for Spe'l'y	Stop Valve.
½	$15.00	$17.00	$1.90	....
¾	16.00	18.00	1.90	....
1	18.00	20.00	2.00	....
1¼	20.00	23.00	2.25	....
1½	23.00	27.00	2.50	$6.00
2	27.00	31.00	2.75	7.50
2¼	32.00	37.00	3.25	9.00
2½	36.00	41.00	3.50	11.00
2¾	40.00	46.00	3.75	12.00
3	45.00	52.00	4.25	14.00
3½	54.00	62.00	4.50	17.00
4	64.00	73.00	5.00	21.00
4½	74.00	84.00	5.50	25.00
5	84.00	95.00	6.00	31.00
5½	97.00	109.00	6.50	37.00
6	112.00	125.00	7.00	42.00
7	132.00	146.00	8.00	50.00
8	160.00	176.00	9.00	60.00
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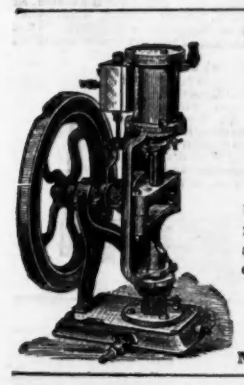

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A New, Cheap and Simple Boiler Feeder.

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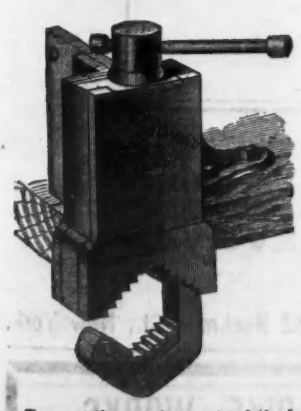

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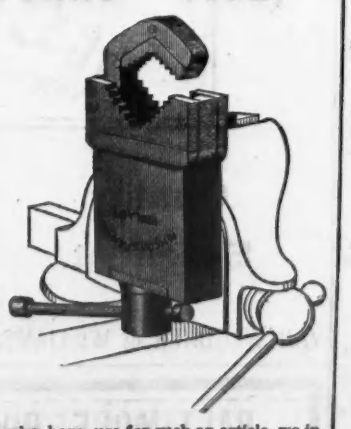

To meet the requirements of the large number of persons who have use for such an article, we invite attention to our Improved Pipe Vise. This Vise can be used either as a permanent fixture to work-bench, attached to angle plate or can (unlike others) be held between the jaws of any Machinist's or Blacksmith's Vise; the movable jaw being OPEN ON SIDE permits work to be gripped at any desired point without slipping it in from end, and allows of FITTINGS BEING HELD securely; the Box is made of Malleable Iron, the Screw of Wrought Iron, and the remainder of Solid Steel throughout. The Steel Gripping Jaws can be duplicated and replaced at any time when worn out. It is a very convenient tool, well adapted to the wants of Plumbers, Pump Fitters, Well-Drivers, and all who have use for a tool that is *strong, light, efficient and cheap* which can be readily carried about with kit of tools.

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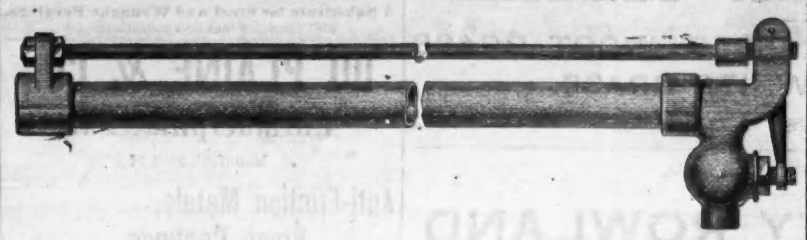

Multiplied Expansion Steam Trap.

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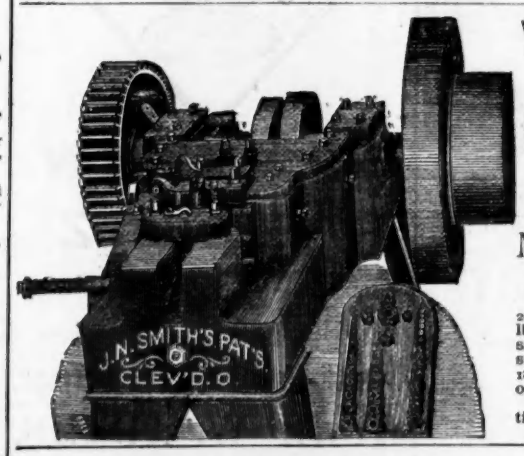

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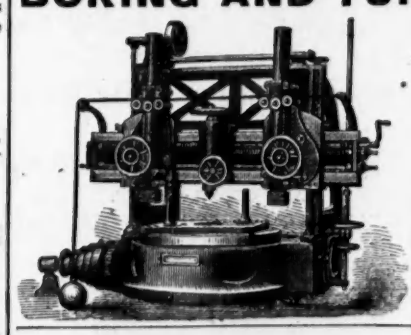

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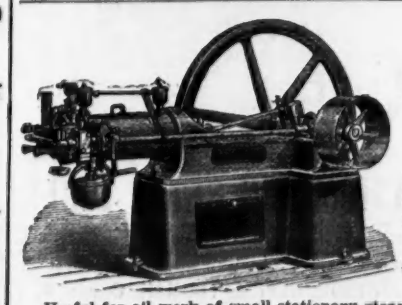

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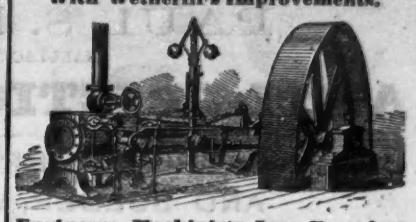

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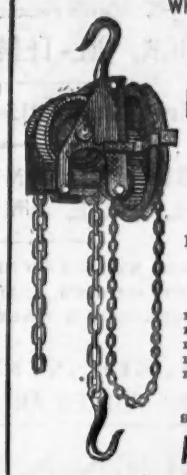

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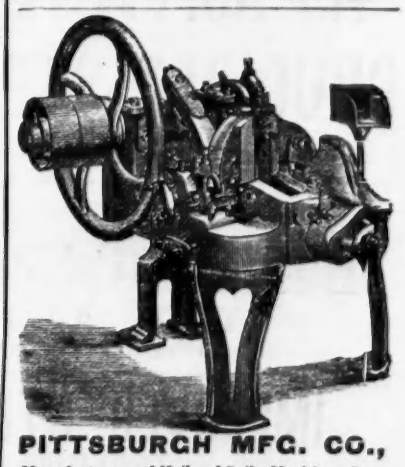

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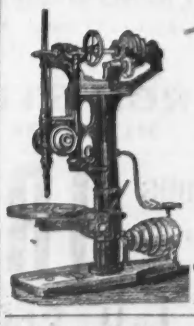

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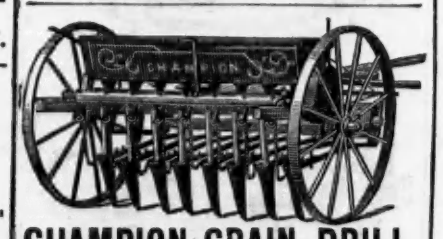

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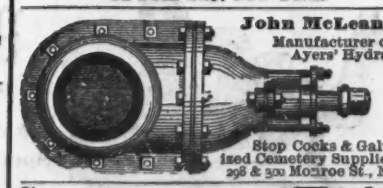

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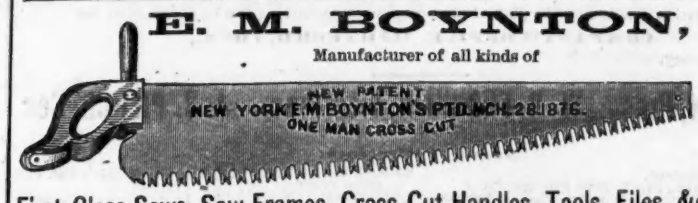

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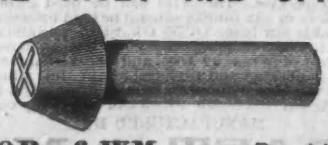

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